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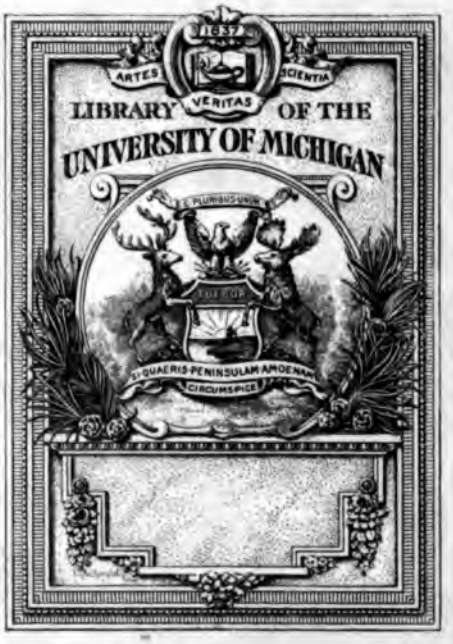
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WAR DEPARTMENT,
Document No. 51.
Office Secretary of War.

REPORT

OF

THE SECRETARY OF WAR.

WAR DEPARTMENT,
Washington, D. C., November 10, 1897.

To the PRESIDENT:

I have the honor to submit the following annual report of the administration of this Department:

It has been the custom of my predecessors to review the reports of the commanding generals and the heads of bureaus, and to submit views and recommendations upon the various subjects coming within the jurisdiction of the Department. Such a review of the work is necessary, but as only the last quarter of the fiscal year, ended on the 30th of June last, fell within my term, it has seemed best to depart from the usual custom by obtaining from the officers immediately responsible a synopsis, in letter form, embracing the principal and more important matters contained in their reports, together with recommendations for such legislation by Congress as in their judgment will tend to the better administration of their respective departments. These letters are herein published in full, followed in each case by such remarks and recommendations as seem to me to be appropriate and necessary.

The full reports are also submitted herewith.

THE ARMY.

HEADQUARTERS OF THE ARMY,
Washington, October 21, 1897.

SIR: I have the honor to submit herewith the annual reports of Major-General Merritt, commanding Department of the East; Major-General Brooke, commanding Department of the Missouri; Brigadier-General Otis, commanding Department of the Colorado; Brigadier-General Coppinger, commanding Department of the Platte; Brigadier-General Shafter, commanding Department of California; Brigadier-Gen-

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eral Wade, commanding Department of Dakota; Brigadier-General Graham, commanding Department of Texas, and Brigadier-General Merriam, commanding Department of the Columbia; also the reports of the Adjutant-General and Inspector-General of the Army, commandant of the Artillery School, Fort Monroe; commandant of the Cavalry and Light Artillery School, Fort Riley, Kans., and the commandant of the Infantry and Cavalry School, Fort Leavenworth, Kans. These reports give the history of the military forces of the different departments, the movements of troops, the important military changes that have occurred during the year, administration and discipline, the results of inspections, the instruction and progress made at the various military schools of practice; also the reports of field operations, practice marches, target practice, etc.

During the last year there has been with one exception a complete change in the stations of the department commanders.

The Army, although inadequate in point of numbers, was never in a higher state of efficiency, both as to the character and qualifications of its officers and intelligence and loyalty of its soldiers. In the report of Major-General Merritt will be noticed the important changes and improvements that have been made along the Atlantic and Gulf coasts, especially in the mounting of modern artillery and the appliances adopted for the defense of the coasts. In this report Major-General Merritt calls especial attention to the report of Colonel Rodgers, inspector of artillery of the department; also to the report of the chief ordnance officer of the department; and in their recommendations concerning the increased efficiency of the artillery service, and especially that the artillery soldiers who qualify as gunners and gunnery specialists shall receive proper compensation, I fully concur.

I also concur in the recommendations of Major-General Brooke concerning the necessity for gymnasiums and drill halls required especially along the line of northern military posts to enable the commands to be properly instructed and exercised during inclement weather or during the winter season; also in his recommendation concerning general-service clerks.

The progress that has been made on the Pacific Coast in the establishment of modern batteries of artillery has made it necessary to occupy new ground and to adopt a new system of defense. The very commanding position known formerly as Lime Point has received a portion of its armament, and will soon become a most formidable part of the defense of the harbor of San Francisco. The name of Lime Point has been changed to "Fort Baker," in honor of the distinguished statesman and hero of two wars, Col. Edward Dickinson Baker, who was killed at Balls Bluff, Va., October 21, 1861. It will be noticed by General Shafter's report that very active and earnest work is being done in putting that important harbor in condition of proper defense. The same work is in progress along the Pacific Coast, especially at San Diego, Cal., and will in time be completed at the mouth of Columbia River, Oregon, and also the entrance to Puget Sound, Washington.

Attention is also invited to the report of General Merriam, commanding Department of the Columbia, especially to the importance of a larger garrison at the entrance of the Columbia River, Oregon, and to his report on the condition and necessities of the great Territory of Alaska.

Alaska is in extent eleven times the area of the State of New York. The recen

discovery of rich gold fields, together with valuable silver and copper mines, the timber and fishery interests of that Territory, are attracting and will attract a very large population to that region, necessitating a more stable civil government, and also the occupation of important points by military and by naval forces. As all the other Territories have been occupied by military posts, and appropriations have been made for military roads, establishment of telegraph lines, bridging of rivers, and in fact aiding and blocking out the way for occupation of the vast Territories by citizens, it is deemed but just and advisable that the same liberal spirit should be manifested toward that great and important Territory.

As far as practicable, it would, in my opinion, be advisable to have its waters thoroughly examined by such of the naval forces as could be used for that purpose; and as military reconnoitering and exploring parties in past years have been sent into that country to furnish knowledge of its character, resources, and necessities, this, in my judgment, should be continued on a larger and more liberal scale. While there is now no conflict between the population, composed of some 20,000 Indians and the white explorers and settlers, as the former are supplied with modern arms, they may become turbulent and troublesome. Such has been the history of nearly all the tribes in other Territories. Hence it would be but reasonable to anticipate the necessities for military forces in that Territory by the establishment of at least three military posts to support the civil authorities, to give protection to the white settlers, and to aid in maintaining law and order in that remote part of our country.

In the report of General Otis it will be observed that during the year there has been conflict with the authorities and disturbance of the peace by the Indians scattered through that portion of the Rocky Mountain region, but by judicious management and prompt action of the civil authorities and military forces serious disturbances of the peace have been avoided.

The report of General Coppinger is very complete and quite important, especially concerning the instruction of troops, practice marches, and practical instruction in minor tactics. His views concerning the inspection system of the Army are also worthy of notice.

The condition of the Indians is better to-day than it has been for many years, and during the last year there has been no serious disturbance of the peace. The Indians are making rapid progress toward permanent settlement and semicivilization. It was a wise provision of Congress that authorized the President to detail experienced officers of the Army to act as Indian agents, and I trust this system will be continued. The number of Indian children that are now receiving the advantages of school education is very large, and it is having a very excellent effect upon the condition of the tribes, as well as upon their progress as a pastoral and an agricultural people. Their condition is being benefited in many ways.

During the last ten years much attention has been given by the Government to the subject of coast defenses, and most beneficial results are now becoming apparent. Approximately $26,000,000 have been appropriated by the Government, which is nearly one-third of what is required to put the country in a safe condition of defense. This has been expended in the construction of modern fortifications and high-power guns of great force and magnitude. These weapons for defense are entirely different from what was known to the world a generation ago. A modern

gun, with its carriage, emplacement, and ammunition, costs on an average $100,000. To properly preserve, keep in working order, and man them in time of hostility requires a most expert and skillful knowledge on the part of both officers and soldiers in the artillery service.

Although the general desire of our people is to maintain a condition of peace with all nations, and the policy of the Government is one of good will and peaceful relations with all others, yet nothing could be more injudicious than to remain in a condition of insecurity and permit the lives of millions and the accumulated wealth of many generations to be destroyed or endangered by any foreign power with which we are liable to come into contact, and the general plan for defense which has been adopted by the Government should be steadily pursued until the nation is in a condition of security and safety which a due regard to self-preservation would demand. I therefore recommend that in the appropriations for the coming fiscal year the following sums be appropriated for the work which is required under the Engineer, Ordnance, and Quartermaster departments; for the purchase of land needed for fortifications; construction of platforms, emplacements, and fortifications; construction of modern high-power guns, mortars, ammunition, gun and mortar carriages, and buildings, quarters, and barracks for troops:

For the mouth of Penobscot River, $175,000; mouth of the Kennebec River, Maine, $198,500; Portland, Me., $1,173,000; Portsmouth, N. H., $377,000; Boston Harbor, $1,347,000; New Bedford, Mass., $204,000; Narragansett Bay, $833,000; defenses of Long Island Sound, $1,070,000; eastern entrance, New York, $489,000; southern entrance, New York, $1,419,000; approaches to Philadelphia, $441,000; approaches to Baltimore, $499,000; approaches to Washington, D. C., $604,000; Hampton Roads, $463,000; approaches to Wilmington, N. C., $397,000; Charleston Harbor, S. C., $150,000; approaches to Savannah, Ga., $415,000; Key West, Fla., $50,000; Pensacola Harbor, $32,000; approaches to Mobile, Ala., $397,000; approaches to New Orleans, $319,000; Galveston, Tex., $412,000; San Diego, Cal., $725,000; San Francisco, Cal., $1,336,000; Columbia River, $605,000; Puget Sound, $1,140,000; Lake Champlain, $48,000.

It is impossible to anticipate the exact cost of every foot of concrete, every ton of steel, or every yard of masonry required for the construction of fortifications, guns, carriages, and ammunition, and military buildings. I therefore earnestly recommend that in the appropriations that are to be made authority be granted by Congress to the honorable the Secretary of War to expend the sums appropriated, as far as practicable, according to the plans submitted, or make such changes as in his judgment are absolutely required by the necessities of the Government during the fiscal year, in order that the different branches of the Government may work in harmony and the work be completed as rapidly as possible, instead of some portions being in excess and others wholly inadequate, as has been the result in some cases in past years.

The necessity for an army is two fold—one to avoid foreign and domestic wars; the other to restore peace with the least possible delay and sacrifice of life and property when war occurs. When such a misfortune comes in the history of a nation, the purpose of an army is to maintain peace, or restore it with the least possible delay; hence the army should be adequate to the growth, development, and necessities of a nation.

The great work that has been going on for the last ten years of placing the 4,000 miles of Atlantic, Gulf, and Pacific coasts in proper condition of defense, and upon which the Government has already expended some $26,000,000, is progressing as rapidly as practicable, and already mortar batteries and high-power guns have been placed in positions requiring the constant care and protection of skilled artillerists. By the 31st of December next the following positions will be armed, in part or fully, with modern appliances of war, and in these important positions there are no troops stationed and none available for assignment to those positions without taking them from other stations where they are at present imperatively required, viz: Portland Head, Portland, Me.; Great Diamond Island, Portland, Me.; Fort Constitution, Portsmouth, N. H.; Grovers Cliff, Boston Harbor, Mass.; Paddocks Island, Boston Harbor, Mass.; Long Island Head, Boston Harbor, Mass.; Dutch Island, Narragansett Bay, R. I.; Great Gull Island, eastern entrance Long Island Sound, N. Y.; Plum Island, eastern entrance Long Island Sound, N. Y.; Fort Hancock, New York Harbor; Finns Point, approach to Philadelphia; North Point, approach to Baltimore; Hawkins Point, approach to Baltimore; Sheridan Point, approach to Washington, D. C.; Fort Caswell, Wilmington, N. C.; Fort Sumter, Charleston, S. C.; Tybee Island, Savannah, Ga.; Fort Morgan, Mobile, Ala.; Fort St. Philip, New Orleans; Fort Point, Galveston, Tex.; Ballast Point, San Diego, Cal.; Fort Baker, San Francisco Harbor, Cal.; Fort Stevens, mouth of Columbia River, Wash.

Several of the places above mentioned have been unoccupied for many years, and many have never been occupied, but the present new system of defense renders their occupation by troops an immediate necessity. The five regiments of artillery are entirely inadequate to man the batteries that the Government has authorized to be placed in positions for the defense of the coast, and at least two additional regiments of artillery are required for immediate duty in this service. I therefore earnestly recommend that Congress authorize an addition of two regiments to the artillery arm of the service. The artillery regiments have heretofore been defectively organized, in having two first lieutenants to each battery—in my judgment an unnecessary expense and an obstruction to proper promotion. I therefore recommend that the artillery arm be increased and organized into seven regiments of artillery, in accordance with the recommendation made in my last annual report, approved by the former Secretary of War, and introduced in a bill presented to the last Senate by the Hon. Joseph Hawley, Senator from Connecticut, chairman of the Military Committee of the Senate.

The demand for the services of the infantry are constantly increasing, so that that branch of the service is inadequate for the requirements of the Government, and in addition to this the great Territory of Alaska that it is now necessary to occupy with suitable garrisons makes a demand for additional infantry imperative, and I recommend that Congress authorize the addition of five regiments to that arm of the service.

In 1866 the Army was organized with 54,000 men, and that, in the judgment of the best military minds and most eminent statesmen of that day, was the minimum force which this nation should maintain. Owing to the fact that the Government was burdened with an unusual and enormous debt, and the depressed financial condition of the country at that time, caused a reduction to be made from 54,000 to 45,000, and

then later to 30,000, and finally to 25,000 men, and this standard has remained so long that the impression has become crystallized that such a number is sufficient for any and all conditions of the country. The number has no significance whatever as to the requirements and necessities of the Government.

In my opinion it would be wise and judicious for Congress to establish a standard limiting the recruiting of the Army for all future time, unless the conditions of the country should be other than what can now be anticipated. The nation is developing in most unusual and extraordinary proportions in wealth and population, and as the Army is one of the pillars of the Republic it is proper that it should grow as the nation grows, commensurate with the needs and requirements of the latter; and I therefore recommend that a standard be fixed and authorized by which the strength of the Army should be regulated in time of peace in proportion to the population and wealth of the nation, and that the maximum of enlisted men be limited to one soldier to every 1,000 population, and the minimum, one soldier to every 2,000 population, the number actually in service within this limit to be determined by the President according to the necessities and requirements of the Government.

If such a policy is adopted it would, in my judgment, put our Government on a safe basis, and while we should neither maintain a great standing army that would be a burden or a menace to our people and institutions, neither should we become a nation of noncombatants and neglect to take the proper precautions that due regard to safety and self-preservation demands. By adopting such a course we would be following the wise injunctions of the first Commander in Chief and President—Washington—not only in maintaining a suitable military force to support the civil Government and protect the Republic, but at the same time we would adopt such a system that if properly administered could in time be commended to the people of other countries.

I again renew the recommendations I have made concerning the granting of commissions and discharge to meritorious noncommissioned officers after five years' service, who shall successfully pass the required examination, as an encouragement and just recognition of their merit and services.

The personnel of the Army, as before stated, is in most excellent condition and is constantly improving. That there is room for much improvement in the war material, I am equally confident, both in arms, equipment, uniform, and transportation, and such improvements would, in my opinion, promote the efficiency of the service. These, however, are matters of detail, requiring executive action rather than legislative, and will be made the subject of special reports in due time.

The record of the Army for the past one hundred years has been a record of heroic deeds and honorable service. It is at present and will in the future be entitled to the highest regard and generous support of our Government and people.

Very respectfully, your obedient servant,

NELSON A. MILES,
Major-General Commanding.

The SECRETARY OF WAR.

General Miles was not required to make a synopsis of his report, as his full report is concise and not long.

It is earnestly urged that his recommendation concerning two additional regiments of artillery be favorably considered. We are erecting great seacoast batteries, as he says, without men to man them. These costly works should, as soon as completed, be manned by a sufficient force to care for and preserve them, and to become familiar with the handling of the guns, the manipulation of which requires experienced services, to be ready at all times to operate them. A visit to any of these batteries must convince any practical mind of the necessity for immediate action in this matter. A battery costing from $100,000 to $500,000 ought not to be manned by a corporal's guard.

ALASKA.

Within the past year, as is of course well known, the great Territory of Alaska has opened up a new problem. It is probable that within another year a very large number of people may be gathered there, estimated by many conservative men as high as 100,000, and I urgently suggest that some adequate measures be adopted by which a military force can be sent to that Territory, if need be, to guard persons and property. In a remote country where there are no laws, and the territory very extensive, there is great danger that there may be much lawlessness and need of a restraining force, and I therefore hope that large powers may be granted the Executive, to provide as far as possible for any emergency that may arise.

On the 20th day of September, Lieutenant-Colonel Randall, of the Eighth Infantry, with 2 officers and 25 men, accompanied by a surgeon and 3 assistants, were sent to St. Michael to establish a post, and for the purpose of guarding property and preserving the peace. The command arrived safely on the 9th ultimo. A military reservation, with headquarters on the island of St. Michael, was created under orders of the 20th ultimo. The creating of further military reservations, in command of prudent officers, given some discretion, may best solve the problem. A boat for transportation and patrol on the Yukon and its tributaries will be essential, and authority is asked to provide one.

On account of the terrible rigor of the weather, and also the inducements for desertion, I recommend that the pay of the enlisted men serving there be increased, with the hope that extra compensation will be an inducement for a very high grade of men to enlist in that particular service.

I recommend the revival of the grade of lieutenant-general. All

the great nations of the world give their officers much higher rank than does the United States, and few, even of the smaller ones, have their commanding general below the grade of lieutenant-general.

It is found upon a full investigation that the military attachés to the different embassies and foreign courts have much higher rank than those from the United States, which places us at a great disadvantage in cases of ceremony. Even small countries send officers with the rank corresponding with that of lieutenant-colonel, colonel, and even brigadier-general, and they take precedence in all matters of ceremony. The cost of living is greatly increased, also, at those stations. It seems to me to be unjust to our officers. I therefore recommend that the military attachés to the different embassies be given the rank and pay, while serving, of colonel, and that the attachés at legations be given the rank and pay of lieutenant-colonel while serving, or at least the rank and pay of major. This higher rank is accorded to the Superintendent of the Military Academy at West Point, and also to the officer in charge of public buildings and grounds in the District of Columbia, while the pay of the engineer commissioner of the District of Columbia, who is detailed from the Corps of Engineers, is increased to that of a Commissioner ($5,000) while serving as such. The commandant of cadets at West Point has the increased rank of lieutenant-colonel, and the principal assistant in the Ordnance Bureau of the War Department and the ordnance storekeeper at Springfield Armory have the increased pay of major.

BOARD OF ORDNANCE AND FORTIFICATION.

WAR DEPARTMENT, BOARD OF ORDNANCE AND FORTIFICATION,
Washington, D. C., October 30, 1897.

SIR: In compliance with your letter of the 13th instant, I have the honor to give herewith a summary of the annual report of the Board of Ordnance and Fortification for the year ending October 31, 1897.

The general operations of the board have comprised the consideration of a great many plans for seacoast defense and the examination of devices and machines pertaining thereto; the perfecting of a system of fire control for seacoast forts, including the equipment of a typical artillery station at Fort Wadsworth; the test of experimental guns and carriages; the investigation of the penetration of shot into a concrete parapet and its sand covering, and the development of a suitable high explosive for charging shells.

The failure of the 8-inch Haskell multicharge gun is mentioned, and the probable causes which led thereto. The board has decided not to experiment further with the system.

Progress is noted in the construction of the 10-inch Brown segmental-tube wire-wound gun, which the manufacturers hope will be ready for test by July 1, 1898.

Four types of mounts for rapid-fire guns are under construction—a pillar and a Crozier-Buffington for 5 and 6 inch guns, and a disappearing and a casemate mount for 3-inch gun.

The 12-inch disappearing carriage of the Crozier-Buffington system has proved a success.

In the selection of a suitable smokeless powder, considerable advance has been made during the past year, and, if necessary, powder for all guns could be ordered.

The Halpine automobile torpedo is nearly finished, and action on other styles of this important adjunct of modern warfare has been postponed pending the result of the test of the Halpine.

The development of an emergency range finder is being carried on, but a type of this instrument has not yet been decided upon.

The report of the committee on high explosives is embodied in full. The result of experiments conducted shows that English gun cotton is slightly better than that of American manufacture. Smokeless powder has been found too sensitive for use in large shells. Further experiments will be made.

The board on the regulation of seacoast artillery fire has been engaged during the year in the formulation of a system of regulations and tactics for coast artillery. The result shows great ability and industry.

In view of the fact that a number of allotments made by the board were not entirely used and were revoked last year, thus increasing the funds at its disposition, the board decided that the appropriation of $150,000 made for the past two years could be reduced to $100,000 without interfering with its work, and an estimate for this amount has been made.

The work of arming our sea coasts is progressing more rapidly than ever before, but there is much left to do. The typical artillery station at Fort Wadsworth is intended to demonstrate how much the effectiveness of the armament can be increased by the appliances of scientific warfare.

The necessity of increasing the personnel of the artillery in order to keep pace with the development of our defensive system is mentioned, and finally the board urges that there be no decrease from the estimates submitted in the appropriations for coast defense, as the work should not be left in a weak and incomplete condition.

Very respectfully,

NELSON A. MILES,
Major-General Commanding the Army, President of the Board.

The SECRATARY OF WAR.

THE SOLDIERS' HOME.

BOARD OF COMMISSIONERS, SOLDIERS' HOME,
Washington, D. C., October 21, 1897.

SIR: I have the honor to submit the following summary of the annual report of the Board of Commissioners of the Soldiers' Home:

The report shows that on September 30, 1897, there were 1,141 beneficiaries on the rolls (an increase of 43 over last year), and that 724 of the beneficiaries were present at the Home at that date.

The income of the Home was as follows:

By settlements of the Treasury Department: Deductions of 12½ cents per month from soldiers, court-martial fines, forfeitures of deserters, etc		$134,256.23
By interest from the permanent fund		81,449.36
By effects of deceased inmates and from miscellaneous sources		5,953.01
Total receipts		221,658.60
The expenditures were:		
To current expenses	$163,744.88	
To permanent improvements	31,101.40	
Total expenditures		194,846.28
Increase in the permanent fund		26,812.32
Balance in United States Treasury September 30, 1897		2,737,597.95

The amount expended for permanent improvements was principally for completing the new amusement hall, purchase of material and hire of labor in wiring for electric-light plant about to be installed, contract having been awarded for the necessary electrical machinery for the purpose.

Of the 724 resident inmates, 566 are receiving pensions from $6 to $30 per month, with one receiving $50 and one $72; and 606 had war service.

The amusement hall was completed in January last, and a variety of excellent entertainments have been given.

The governor reported that almost the only disorders that have occurred at the Home were the result of intemperance, an evil that can not be cured and can only be ameliorated by wise disciplinary measures.

Special attention has been given by the board to the food supplies, which have been brought up to a higher standard.

An excellent library is provided with daily and weekly papers and magazines, and the buildings have been kept in good repair, and the grounds and driveways are in excellent condition.

Very respectfully,

NELSON A. MILES,
Major-General Commanding the Army,
President Board of Commissioners.

The SECRETARY OF WAR.

The excellent condition of the Home in the District of Columbia for soldiers of the Regular Army, as shown in the foregoing summary, is due in large measure to the wise management of the board of commissioners, consisting of the General Commanding the Army, the Surgeon General, the Commissary-General, the Adjutant-General, the Quartermaster-General, the Judge-Advocate-General, and the governor of the Home.

THE MILITARY ACADEMY.

WAR DEPARTMENT,
ADJUTANT-GENERAL'S OFFICE,
October 21, 1897.

SIR: In compliance with circular letter of the 13th instant from your office, I have the honor to submit herewith a synopsis of the report of the Superintendent of the United States Military Academy for the year ended September 1, 1897:

PERSONNEL.

The number of officers and instructors on duty at West Point September 1, 1897, is the same as on September 1, 1896, to wit, 7 professors, 1 associate professor, 55 commissioned officers, 1 chaplain, 1 sword master, and 1 teacher of music; total, 66.

The number of cadets on September 1, 1897, was 338, including 1 foreigner receiving instruction by special authority of Congress. This is the largest number of cadets that has ever belonged to the Academy at one time. During the year 48 were discharged for deficiency in studies and 1 for disability; 6 resigned, and 68, including 1 foreigner, were graduated, a total loss of 123, while there were admitted in all, at the examinations held in March, June, and August, 129, leaving 34 vacancies.

The recommendation of former reports that a moderate increase be made in the number of cadets authorized by law, such as would be obtained by appointing two at large from each State, to be nominated by the Senators representing the respective States in Congress, is renewed.

ACADEMIC DEPARTMENTS.

The heads of the various departments of instruction have kept abreast of all advances in their special branches of knowledge and have not failed to introduce improvements when opportunity afforded.

By act of February 10, 1897, the senior assistant instructor of ordnance and gunnery is allowed the pay of captain mounted, as had previously been the rule with nearly every other department. The department of practical military engineering is now the only one in which the senior assistant receives no extra compensation. It seems but just that it should be placed upon the same footing in this respect as the others and that the senior assistant should receive the pay of captain mounted.

LIBRARY.

One of the most pressing needs of the Academy is the reconstruction of the library building, for which full plans, specifications, and estimates for the work have been prepared. The necessity and urgency of this work is explained in the appendix marked B.

The recommendation in former reports that the salary of the assistant librarian be increased from $1,200 to $1,500 per annum is renewed.

HEALTH.

The health of the command during the year was decidedly better than during the year before. Five deaths occurred among the civilians residing upon the post.

One enlisted man, Sergt. Anthony Brechbiel, of Company E, Battalion of Engineers, lost his life in a gallant attempt to rescue others from drowning.

DISCIPLINE AND DRILL.

The state of discipline and drill of the corps of cadets has been maintained at its usual high standard.

ACCOUNTS AND SUPPLIES.

The cost of subsistence during the year averaged a trifle over 52 cents per day to each cadet, which is a slight reduction from the cost of the year before, while there was no reduction in the quality, variety, or abundance of the food provided.

BAND.

Renews former recommendation that the band be restored to the number and pay which it had before the reduction in 1877, to wit: One teacher of music and 40 enlisted musicians, of which 10 received $34 and the remaining 30 received $30 per month, with the usual allowances of enlisted men. It is further recommended that the leader receive the rank, pay, and allowances of a second lieutenant of infantry.

MASTER OF THE SWORD.

It is recommended that legislation be solicited giving the sword master the rank, pay, and emoluments of a first lieutenant of infantry. The present incumbent, a civilian, is required to preserve discipline and to exercise control of cadets while under his instruction. It would greatly strengthen his hand if he should have military rank.

WATER SUPPLY.

Reports that good progress was made in work connected with the new reservoir. Estimates are submitted for the completion of the dam and filter beds and of the roadways, fences, keeper's dwelling, and other improvements connected with the reservoir.

BUILDINGS AND GROUNDS.

Reports improvement of the new portion of the post cemetery; the replacement of the old surface cable railway for transporting coal from the north dock to the top of the hill by a suspension cable way leading in a straight line from the coal shed at the top of the hill to a new dock constructed for the purpose; the construction of the new guardhouse and gates near the southern boundary of the reservation; the construction of a latrine for the use of the public; the construction of an addition to the schoolhouse for soldiers' children; the erection of a wooden building to accommodate the public photographer. Many minor improvements were made.

ESTIMATES.

The estimates for the next fiscal year are essentially the same as those of the last year. They have been carefully prepared and are commended to favorable consideration. The necessity of each item is explained in the remarks attached thereto.

CONCLUSION.

In conclusion, the Superintendent reports that the Military Academy is doing the work assigned to it as thoroughly now as at any period of its history; that its equipment is better than it ever was before; and that its professors and officers are characterized by the same ability, industry, zeal, and patriotism for which they have always been distinguished.

Very respectfully,

SAM'L BRECK,
Adjutant-General.

The SECRETARY OF WAR.

The Military Academy at West Point can accommodate more students, and if provision is made for two additional regiments of artillery, as recommended, the Army can absorb more of its graduates. The superintendent recommends legislation to authorize the appointment of two cadets at large from each State, to be nominated by Senators. This would give 90 cadets more than at present. It is desirable that there should be no surplus graduates, and I recommend as an alternative that the President be authorized to appoint 10 cadets at large each year. This would be an excess of 30 cadets over the number now authorized. Under section 1315 of the Revised Statutes the President had this power, but by the act of June 11, 1878, it was provided "that cadets at large at the Military Academy shall not hereafter exceed ten in all."

The senior assistant in the department of practical military engineering should be allowed the pay of a captain mounted, thus placing him on an equal footing with the senior assistants in all the other departments. For the military reasons stated in the foregoing letter, the master of the sword should be given the rank, pay, and emoluments of a first lieutenant of infantry. The master of the sword, a civilian, receives $1,500; a first lieutenant of infantry the same; the only difference, apart from military reasons, would be the allowances of the grade.

ADJUTANT-GENERAL'S DEPARTMENT.

WAR DEPARTMENT,
ADJUTANT-GENERAL'S OFFICE,
Washington, October 19, 1897.

SIR: In compliance with your request, I have the honor to submit the following synopsis of my annual report:

ADJUTANT-GENERAL'S DEPARTMENT.

By retirement of two colonels, the death of one major, and the retirement of General Ruggles and my appointment as Adjutant-General, four vacancies in junior grade were filled by appointment of Majors Wagner, Carter, Barry, and Heistand.

MILITARY INFORMATION DIVISION.

Major Wagner assumed charge April 7, 1897. His untiring devotion has already added much to value of work of division.

Numerous changes took place among military attachés. Switzerland and Japan added to countries where our embassies and legations have a military attaché. This class of officers is of great value, the reports received covering new developments in military science, arms, equipments, etc.

Work of collecting information from abroad pursued and systematized as much as permitted by small number of officers on duty.

Pamphlets on the Swedish Army, the Organized Militia of the United States in 1896, and the Military Systems of Greece and Turkey, with Description of Græco-Turkish Frontiers, were published during the year. Several other publications are now ready for the press. Demand far exceeds authorized edition of 1,000 copies.

Progress and usefulness much hindered by scant accommodations; division, a special field for capable juniors of the line, and more should be employed; better facilities should be provided for indexing, classifying of papers, books, and reports to make them available for constant use to which put.

Present appropriation of $3,640 inadequate; its increase earnestly recommended. Careful calculation shows that $6,000 for contingent expenses of division and military attachés could be expended with advantage.

RECRUITING SERVICE.

Conducted with unusually good results; 4,762 recruits sent to regiments, 3,879 directly from recruiting stations and 883 from rendezvous; sent singly or in small detachments in charge of one of the men, thus avoiding expense for guards or escorts; only 5 desertions en route; 3,581 enlisted at posts where the men were to serve, saving expense for transportation. Largest number of recruits at one time at the four rendezvouses, 108; smallest, 19; average, 11 to each rendezvous.

Efforts to increase enlistments at posts markedly successful; percentage of post enlistments, 51; an increase of 6 per cent over preceding year.

Recruiting restricted to exceptionally desirable men. Vacancies in the Army July 31, 1897, 350; greatest number during the year, 553; smallest, 203; general average, less than one to the company.

Of 23 general recruiting stations in October, 1896, 7 have been closed. Since October 1, 1893, there has been a total reduction of 33 city recruiting stations. With larger opportunities for employment, the number of stations and officers will, no doubt, have to be increased.

Of the 8,285 accepted applicants, 6,239 were native born, 2,046 of foreign birth. Total enlistments, 5,280; reenlistments, 3,005; percentage of native-born recruits, 83½; 41,058 applicants rejected, slightly over 83½ per cent of the number seeking enlistment; 2,791 rejected as aliens and 2,333 for illiteracy.

Discharge of the 53 Indians comprising Troop L, Seventh Cavalry, ended the scheme formulated six years ago for an Indian contingent as part of the Army Contingent never reached a degree of substantial success as useful soldiers.

MILITARY COLLEGES.

From tabulated data, results during last scholastic year not materially different from those reported for preceding year. Thirty-one thousand eight hundred and twenty-eight students present; 29,147 over 15 years of age; 26,227 capable of military duty; 15,516 enrolled as military students; 12,221 uniformed; total that received military instruction, 15,608; attendance at artillery drills, 1,214, and at infantry drills, 11,138.

Experience points out necessity of amending law authorizing details. Colleges, etc., must show now that a capacity exists for educating 150 pupils at same time; condition should be that not less than 150 are actually present. At 23 colleges the number of pupils present ranges from 50 to 100; at 7 of them the number was less than 50.

Value of military training as a factor of discipline is evidenced by the fact that, in most instances, degree of discipline is in direct ratio with amount of interest in military instruction manifested by the faculty.

Great lack of facilities for both indoor and outdoor exercises; none indoor at 25 colleges and inadequate at 30 others; none outdoor at 6 and poor at 10.

Good work of the officers successively commanding the Omaha High School cadets (with permission of War Department) steadily increasing; battalion of four uniformed companies, a drum corps, and one ununiformed company; average drill attendance, 248; satisfaction with the uniform (costing, complete, $12.65) shown by the voluntary purchase of over 200 uniforms.

High schools embrace an element that makes our greatest strength, but it is not extensively reached through the institutions having now a military detail. Looking to dissemination of elements of military instruction to youths at the most receptive condition of mind, high schools are logical objectives. Capable sergeants, however, could perform these duties.

MILITARY ACADEMY.

Number of cadets September 1, 1897, was 338 (including 1 foreigner)—largest ever present at the Academy at one time; 68 cadets graduated, 48 discharged for deficiency, 1 for disability, 6 resigned; total admissions 129, leaving 34 vacancies. (Three hundred and seventy-one legal strength; 384 could be accommodated.)

Recommends that the adjutant, whose duties are important and exacting, receive pay of captain mounted. (The adjutant receives now pay of regimental adjutant, $1,800; recommendation would give him, $2,000.)

Hope expressed that the bill favorably recommended by both military committees, giving master of the sword the pay, etc., of first lieutenant of infantry, will become a law at approaching session of Congress. (Master of the sword, a civilian, receives $1,500; first lieutenant of infantry, the same; the only difference, apart from military reasons, would be giving him the allowances, etc., of the grade.)

Improvement of library building has become a pressing need.

Discipline and drill of cadets maintained at usual high standard; gratifying to state that health of command decidedly better than during preceding year.

CHAPLAINS.

Law deficient in not fixing age limit at appointment; over half between 40 and 55 when appointed.

Recommends no appointment of men over 30, or at most 35; candidate to be examined by board of 3 chaplains of same denomination as applicant and 2 medical officers, to determine physical, educational, and mental adaptability and qualifications; if chaplains not available, eminent clergymen attached to universities of denomination of candidate, to be employed as members; details of subjects, etc., determined by War Department as in case of other officers.

Conditions of chaplain's field differ widely from ordinary parish work; difficult for a middle-aged man to adapt himself to changed ways of life and new modes of thought and action; chaplains commencing when young can go where and do what an older man, as a beginner, would not even think of, or if thinking, would hardly ever learn to do effectively.

DETACHED SERVICE OF OFFICERS.

Details at colleges, with militia, etc., a heavy draft on effective strength, being additional to details for Military Academy, service schools, and recruiting; present number of such details can not be enlarged without serious injury to the service; artillery suffers especially, as subalterns of long service seek detail to colleges to aid in education of their children, which small pay and advancing years make a heavy tax on this meritorious class. Recommends number of officers at colleges, etc., be not increased. Service of artillery officers much needed now in their regular duties.

LAND FOR MINOR TACTICAL EXERCISES AND RIFLE RANGES.

Grounds for above needed at all permanent cavalry and infantry posts; recommends that they be provided for at Columbus and Washington barracks, Forts Sam Houston and Myer; also tract of ample size, say, near Columbus Barracks, Ohio, for instruction of Army with militia of several States in field duties; provision to be made by law for command and service of camp and for calling militia to it.

INCREASE OF THE ARTILLERY AND INFANTRY.

Urgently recommends that Congress be asked to pass bill now before it adding two regiments of artillery and two companies to each regiment of infantry. Bill has been reported favorably by both military committees and strongly recommended by Secretary of War and Major-General Commanding; is an absolutely necessary provision for care and use of seacoast defenses to meet the emergencies of the country's service.

ENLISTED MEN.

Character and efficiency of men in the ranks never higher. Short term of service, elimination of disadvantageous element, through purchase or order, careful recruiting, physical training, instruction, athletics, etc., coupled with judicious and humane discipline, have placed in the Army men of good character and conduct, fine physique, and highly efficient. Officials and press speak warmly of Army men when brought in contact with militia at camps of instruction and other places.

PAY OF NONCOMMISSIONED OFFICERS.

Earnestly recommended that attention of Congress be called to measure pending regulating pay of noncommissioned officers. Too much stress can hardly be laid on importance of duties and responsibility of the noncommissioned officers of the line—of artillery especially. To retain the best, remedy of inadequacy of present pay a factor of no small importance. Early passage of comprehensive measure covering the subject deemed of vital importance to best interests of the Army.

NEWSPAPER PUBLICATIONS.

For obvious reasons, all possible safeguards taken within sphere of military jurisdiction to prevent preparation for lake or coast defense being made known, but publication of articles on subject mischievous and dangerous. Their preparation, possession, or use, except for official purposes, should be forbidden by law under severe penalty.

CLERICAL DUTY IN THE ARMY.

Duties of this class of, now, civilian clerks assimilate to those performed by clerks in War Department, but compensation graded on much lower scale; especially true of chief clerk at general and department headquarters, whose duties demand large range of knowledge of military administration, Army regulations, laws, etc. To partly remedy existing unwarranted inequality, recommends that chief clerk at general headquarters receive pay of clerk of Class IV ($1,800); chief clerk at several department headquarters pay of Class III ($1,600); partial rerating simple justice to highly efficient men to be benefited. (This force provided for in Army appropriation bill; increase involved, $5,600.)

HALL OF RECORDS.

Crowded condition of rooms with clerks and records demands at least 10 additional rooms, average size; numerous calls from many patriotic persons and societies should, in the encouragement of patriotism, be met in a liberal spirit, and older records made readily accessible; a hall of records, a necessity which can not too strongly be urged, will afford much needed relief to War Department; recommends Congress be urgently requested to authorize additional building.

GOVERNMENT HOSPITAL FOR THE INSANE.

Three officers (1 retired) and 22 men (1 retired) admitted; 2 officers and 11 men (1 retired) discharged; 1 officer (retired) and 11 men have died during the past year.

THE ADJUTANT-GENERAL'S OFFICE.

Legal organization unchanged; entire clerical force actively employed on current work; calls of various offices for information received up to September 1, 1897, were all answered at that date.

Current business satisfactorily dispatched, though conducted under serious disadvantage of crowded quarters and increasing inadequacy of space for records and files.

Duties of clerks in this office second to none in importance, but organization with regard to higher grades below that in other bureaus, and operates to deprive valuable clerks in lower class from reasonable expectation of advancement rewarding intelligent, faithful, and prolonged service. Recommends that number in Class III ($1,600) be increased from 14 to 20, in Class II ($1,400) from 13 to 25, while number in Class I ($1,200) be reduced from 58 to 40, thus leaving total unchanged; recommendation is in line not only of justice but increased efficiency; ratio in Classes III and II will still be lower than in several other bureaus of the Department; increase in appropriation (legislative bill) will be only $4,800.

Concludes by bearing testimony to general intelligence, zeal, and efficiency of the clerks of this office.

Respectfully submitted.

SAM'L BRECK, *Adjutant-General.*

The SECRETARY OF WAR.

The fact that of the total number of applicants for enlistment 41,058 have been rejected, and 8,285 accepted, shows the care exercised in the selection of recruits for the Army.

The graduates of the military colleges of the country will furnish a trained body of young men available in time of need. The work would be more valuable, however, if the law which authorizes the detail of officers of the Army to colleges *having a capacity to educate* 150 pupils at one time was amended to authorize the details now provided by law only at such colleges and other institutions of learning as have not less than 150 pupils *actually present* for instruction.

The increase of the artillery has been discussed by the Major-General Commanding, and my views favorable to the measure follow his remarks.

INSPECTOR-GENERAL'S DEPARTMENT.

WAR DEPARTMENT, INSPECTOR-GENERAL'S OFFICE,
Washington, D. C., October 26, 1897.

SIR: In compliance with instructions, the following summary of matters mentioned in the annual reports of this Department for 1897, and possibly requiring legislative action, is submitted:

APPRENTICE BATTALION.

The apprentice battalion system, so successfully established in the Navy, would be of great advantage to the Army, and it is respectfully recommended that Congress be urged to enact the necessary legislation for the establishment of a system and organization of a battalion of apprentices from 16 to 18 years of age, representative of the whole country, to be assigned after thorough training under the regulations of the War Department to certain designated permanent organizations until the type is thoroughly established in the service.

NATIONAL GUARD.

The National Guard is our main traditional reliance for the common defense. Its need for funds is most severely felt. A more adequate sum should be appropriated toward its maintenance.

MANEUVERS.

To obtain the utmost effectiveness, exercises simulating war are as imperative as the prior training of the individual soldier, and funds should be appropriated for field maneuvers, combined when practicable with the National Guard. With the passing of the veterans skilled in handling large bodies of troops, this subject demands serious and prompt attention.

SERVICE AND POST SCHOOLS.

To secure the best possible results, the admirable post-graduate service schools need a larger allotment of funds. The enlistment of the ignorant is now prohibited by law, so post should be made military schools intended more for the professional advancement of the enlisted men than their education in merely the common English branches.

ALLOWANCE OF QUARTERS.

The allowance of quarters established by the act of Congress approved June 18, 1878, is far below what is needed for ordinary comfort, and the requirements of the law are practically ignored in the construction of new posts. It is suggested that a readjustment of this allowance be made and presented for Congressional approval.

GYMNASIA.

It is suggested that in order to provide adequately equipped gymnasia at army posts, which are so essential to the physical training of the soldier, a larger appropriation for this purpose be asked from Congress.

REGIMENTAL CAVALRY POST.

The benefit to the service of the establishment of a regimental cavalry post east of the Mississippi River is respectfully submitted.

FUND FOR WIDOWS AND ORPHANS.

It is recommended that a fund be provided for the relief of the widows and orphans of military men by the stoppage of an equitable percentage of the pay of all persons hereafter appointed in the Army until they finally leave the service, in addition to all fines and forfeitures imposed upon commissioned officers by courts-martial and not otherwise expressly dedicated, said fund to be disbursed under such regulations as the Secretary of War may establish. A relief fund could thus be provided without any increased expense to the Government.

MILITARY COLLEGES.

In order to encourage the study of military science and tactics at civil institutions of learning, provision should be made for the appointment in the Army of the best college cadets and for the gratuitous issue or sale of uniforms.

INSPECTOR-GENERAL'S DEPARTMENT.

An increase in the number of the permanent officers of the Inspector-General's Department, as well as the clerical force and messengers, is respectfully urged, that the work may be adequately and efficiently performed without excessive and unusual labor.

LEGAL ESTABLISHMENT OF INSPECTION DUTIES.

The establishment by law of the duties of the Inspector-General's Department would promote economy and add to the efficiency and regularity of inspection work. Some of the duties of this Bureau, as the inspection of the Soldiers' Homes and of Army disbursements, or the designation of subsistence supplies kept for sale, or the condemnation of military stores, have been legally established, while others have been established partly by orders and partly by immemorial custom.

Very respectfully,

J. C. BRECKINRIDGE,
Inspector-General.

The SECRETARY OF WAR.

The Inspector-General's Department is charged with the duty of inspecting military commands, the money accounts of disbursing officers of the Army, the accounts of the National Home for Disabled Volunteer Soldiers, and inspects also the colleges and institutions of learning at which officers of the Army are detailed as military instructors, besides numerous other inspections of a minor character. The duties are of a delicate and important nature. Its officers go from point to point, observing, criticising, and suggesting such changes as in their opinion will tend to better administration.

I invite attention to the suggestions of the Inspector-General.

JUDGE-ADVOCATE-GENERAL'S DEPARTMENT.

WAR DEPARTMENT,
OFFICE OF THE JUDGE-ADVOCATE-GENERAL,
Washington, October 14, 1897.

SIR: I have the honor to submit the following summary of my annual report for the twelve months ending August 31, 1897:

The number of trials by general courts-martial was 1,384, which is 102 less than last year. There has also been a decrease of 127 in the number of trials by inferior courts-martial. The number of convictions of desertion was 244, which is 12 less than last year and 274 less than during the twelve months ending August 31, 1894.

Attention is invited to two bills which were submitted to the Fifty-fourth Congress, and the hope is expressed that Congress will pass them at the coming session. One of these bills passed the House of Representatives March 24, 1896, but was not reported in the Senate. It is an amendment of section 5391 of the Revised Statutes, and is intended to provide a proper system of ordinary criminal jurisdiction of the United States in military reservations and other places under the exclusive jurisdic-

tion of the United States. This legislation is made necessary by the fact that section 5391, Revised Statutes, as construed by the courts, extends the criminal laws of the State only over reservations or cessions in States existing in 1866, which was the date of the last act from which the section was taken. In States created since there is no system of ordinary criminal jurisdiction in places of this character, except so far as statutes of the United States furnish it. The result is that this leaves unpunishable many criminal acts committed in these places.

The other bill recommended is an amendment of the summary-court act. Under the present summary-court act there can be a summary court only at posts where there are line officers second in rank, or where there are only staff officers on duty, or where but one commissioned officer is present with a command. This, however, does not cover all cases, as, for example, where there are present a line officer, in command, and two or more staff officers, and it is desired to remedy this by giving the appointment of the summary-court officer to the post or higher commander. It would also have the advantage of permitting the selection of well-qualified officers. Another feature of this bill is that it proposes to place under the discipline of the Articles of War military prisoners who have been dishonorably discharged. This is deemed necessary for the maintenance of proper discipline.

Prior to 1894 the designation of the amount of the reward for the apprehension of deserters was left to the Secretary of War, but in that year it was fixed by Congress at $10. This amount is entirely insufficient, and the belief of the officers best able to judge is that it encourages desertion. A return to the former practice of leaving the designation of the amount to the Secretary of War is recommended, or at least a large increase of the reward.

Very respectfully,

G. NORMAN LIEBER,
Judge-Advocate-General.

The SECRETARY OF WAR.

The necessity for legislation to provide a proper system of ordinary criminal jurisdiction in military reservations, to amend the summary-court act, and to leave to the discretion of the Secretary of War the designation of the amount of the reward for the apprehension of deserters is fully stated in the report of the Judge-Advocate-General, and it is hoped that his recommendations may receive favorable action at the coming session of Congress.

QUARTERMASTER'S DEPARTMENT.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, October 14, 1897.

SIR: In accordance with your request of the 13th instant, I have the honor to submit below a short summary of my annual report for the fiscal year ended June 30, 1897:

There was appropriated for the regular service of the Quartermaster's Department for the fiscal year ending June 30, 1897, the sum of $8,162,938, of which the

sum of $1,837,845.26 remained undrawn at the close of the year, but will be required to meet outstanding obligations entered into prior to June 30, 1897.

The issues to the militia of the several States and Territories during the fiscal year amounted to the sum of $164,294.29.

The sum of $11,654.06 was expended from the appropriations of the Quartermaster's Department for the maintenance of the Apache Indian prisoners of war and their families, confined by the military authorities at Fort Sill, Okla.

Under authority of Congress, approved March 24, 1897, the sum of $7,837.97 was expended for the purchase of tents for the use of the people who were rendered homeless by the inundations of the Mississippi River last spring. Nearly all of these tents were distributed to Memphis, Helena, and Vicksburg.

Tents were also supplied to the citizens of El Paso, Tex., who were rendered homeless by the inundations of the Rio Grande, and to the cyclone sufferers at Chandler, Okla.

The cost of the principal movements of troops in changing station was $182,640.99, of which amount the sum of $25,248.04 was expended since March 4, 1897.

The sum of $28,475.65 was expended for transportation of troops in connection with summer encampments and target practice.

MILITARY POSTS AND BARRACKS AND QUARTERS.

The sum of $1,150,000 was appropriated during the last fiscal year for military posts and barracks and quarters, which sum has been duly apportioned for the construction, repair, and alteration of public buildings at the various military posts, and for rent. Many of the improvements authorized have been completed, and others are in course of erection or under contract.

FORT HARRISON, MONT.

The sum of $40,000 was appropriated by Congress, under act approved June 11, 1896, for this post, which has been expended in the construction of one double barrack and one double set of officers' quarters.

FORT WAYNE, MICH.

In addition to other improvements made at this post, the sum of $20,000, provided by Congress by act approved June 11, 1896, has been expended in grading and filling in the river front.

MILITARY POST AT SPOKANE, WASH.

The sum of $100,000 was provided by Congress, by act approved June 11, 1896, to begin the construction of permanent buildings, provide sewerage, water supply, and other necessary improvements at Spokane, which sum is being expended for the purpose.

FORT RILEY, KANS.

Under the act of June 11, 1896, Congress provided the sum of $75,000 to continue the construction of buildings at Fort Riley, Kans., which sum is being expended in the construction of various necessary buildings at that post.

FORT D. A. RUSSELL, WYO.

Congress by the same act appropriated $40,000 to extend the barracks at this post. This sum has been expended in making brick additions to the existing barracks.

FORT PORTER, BUFFALO, N. Y.

The sum of $24,170.20 was allotted during the year for the construction of three double sets of officers' quarters and one double set of noncommissioned staff officers' quarters, including plumbing, heating, and gas piping for same.

FORT MONROE, VA.

Congress provided by act approved June 11, 1896, the sum of $15,000 to erect upon the Government reservation at this post a post-office building to cover quarters for the postmaster and office accommodations for customs officer and United States commissioner. This building is being erected under contract.

MILITARY POST AT BISMARCK, N. DAK.

By act of Congress approved June 11, 1896, the sum of $40,000 was provided by Congress for beginning the construction of permanent buildings for a military post at Bismarck, which the Secretary of War was authorized to establish by act approved March 2, 1895, provided that a sufficient quantity of land, not less than 640 acres, suitable for the purpose should be donated free of cost to the United States.

As none of the sites offered by the citizens of Bismarck and vicinity were suitable for the establishment of a military post thereon, no steps have been taken for the erection of buildings at that place, and no portion of the funds provided for that special object has been expended. The appropriation for this purpose was an annual one and is therefore no longer available.

HALL OF RECORDS.

Attention is again called to the necessity of a suitable fireproof building to contain the records of all the Executive Departments. The congested conditions of the space for storage of valuable papers in the War Department calls for early action. This subject was considered at the second session of the Fifty-fourth Congress, but no legislation resulted. It is earnestly hoped that Congress will give further consideration to this important matter at its coming session.

The location of this building is of great importance, and should be within convenient access to all the Executive Departments.

The estimates for the ensuing fiscal year differ from the appropriations for the current fiscal year as follows:

Army transportation, increase, $100,000. Because of the unusual demands being made for transporting heavy ordnance, guns and gun carriages, and mortar batteries.

Construction and repair of hospitals, increase, $25,000.

Quarters for hospital stewards, increase, $3,000. Because of increased accommodations required, and upon estimates and recommendation of the Surgeon-General.

Repairing road to national cemeteries, increase, $14,000. Because of much needed repairs.

Burial of indigent soldiers, increase, $1,000. Because of the constantly increasing number of deaths occurring among old soldiers.

Road to the national cemetery, Presidio of San Francisco, Cal., increase, $5,000. This sum will be actually required to complete the stone inclosing wall now under construction.

Improvement of Yellowstone National Park, increase, $15,000. Because of the necessity for building substantial roads with proper safeguards against accidents.

Military posts, increase, $1,580,000. Because of the necessity for immediate construction of barracks and quarters in connection with the modern seacoast armaments involving the establishment on the coast of ten or twelve new military posts and the enlargement of several others.

Very respectfully,

GEO. H. WEEKS,
Quartermaster-General, U. S. Army.

The SECRETARY OF WAR.

The Departments are crowded with files of official papers to the detriment of the working force and the serious inconvenience of the public business. Costly public buildings erected for office purposes should not be used for storage. The files not in current use should be stored elsewhere. A hall of records becomes more and more necessary each year. I fully concur with the views of the Adjutant-General and Quartermaster-General upon this subject.

An increase in the appropriation for army transportation is necessary to move heavy ordnance, guns and gun carriages, including mortars. The estimate is $2,500,000, an increase of $100,000 over the current appropriation.

An increase is also necessary in the appropriation for military posts, to provide barracks and quarters for a number of new posts on the seacoast, and to enlarge others. The present appropriation is $420,000, and the estimate submitted is for $2,000,000, an increase of $1,580,000.

While the amounts asked for are large, the greatest care to confine the expenditures to the minimum will be observed.

SUBSISTENCE DEPARTMENT.

WAR DEPARTMENT,
OFFICE COMMISSARY-GENERAL OF SUBSISTENCE,
Washington, D. C., October 14, 1897.

SIR: In the absence of Gen. Thomas C. Sullivan, Commissary-General of Subsistence, I have the honor to submit, in compliance with your circular of 13th instant, the following summary of his annual report:

The Commissary-General submits statistical information concerning the operations of his Department, including statement of its finances; report of issues made to Indians; report of expenditures for various special objects; report of value of stores

lost by accident, by wastage in transportation, in store, etc.; report of sale of condemned and obsolete subsistence supplies; report of sales on credit, and statement relating to the number of commissary sergeants in service. He gives a résumé of the work of the clerical force of his office, and urgently requests that, by a slight rearrangement of salaries of the force, there shall be two clerks of the fourth class allowed the office instead of one, as at present. There are two divisions in the office, at the head of each of which should be a clerk of class 4. As the rearrangement proposed does not increase the expense over the amount usually appropriated, this slight change it is hoped will be incorporated in the legislative, executive, and judicial appropriation bill and passed at the next session of Congress.

An experimental trial of the emergency ration was made in the field by a troop of cavalry during the year. The result seemed in the opinion of the Commissary-General to establish the efficiency of the emergency ration as a means of sustaining the muscular power and activity of men under prolonged physical strain, but he thinks its full efficiency needs yet to be tested under conditions in which the men will be subjected to the excitements, anxieties, and fatigues attendant upon dangerous proximity to, or actual conflict with, an enemy.

He makes detailed report of the distribution of subsistence supplies, under the joint resolutions of April 7 and June 9, 1897, to destitute persons requiring assistance in the districts overflowed by the Mississippi and its tributaries, by the Red River of the North, and by the Rio Grande at El Paso, Tex. There were distributed for relief on the Mississippi and its tributaries supplies amounting in value to $70,417.27; for relief on the Red River of the North, $4,884.66; and for relief on the Rio Grande, at El Paso, Tex., $579.44. Of the total amount of $200,000 placed by Congress at the disposal of the Department about $124,000 will remain unused in the Treasury.

The increase of the estimate for subsistence of the Army for the fiscal year 1899 over the amount appropriated for the fiscal year 1898 is $4,653.75. The system of making frequent shipments of subsistence supplies to the various posts and stations, instead of stocking up the storehouses with large quantities of stores to last for lengthened periods of time, insures the freshness of the food supply at each of these places, and incidentally frees the appropriation for subsistence of the Army from the necessity of being invested much in advance of the actual needs for food. As a consequence, a margin of the appropriation, depending in amount in part on the demands of the Army for the stores which are required to be provided for sales to officers and enlisted men and in part on the rise and fall in prices during the year, is left over undrawn from the Treasury at the end of each fiscal year; but the placing of the yearly appropriation at the fixed sum of $1,650,000 gives reasonable security against a deficiency, and any unexpended balance is ultimately carried to the surplus fund. The excess of $4,653.75 in the estimate may therefore be disregarded in making the appropriation for the fiscal year 1899.

Very respectfully, W. H. BELL,

Acting Commissary-General of Subsistence.

The SECRETARY OF WAR.

It gives me pleasure to commend the work of distribution of relief to the sufferers from the overflow of the Mississippi River, the Red River

of the North, and the Rio Grande. As soon as the joint resolutions of April 7 and June 9, 1897, were approved, officers were dispatched to the scenes of the overflow, and they rendered prompt and efficient aid to the distressed. Of the $200,000 appropriated, the Commissary-General reports a balance of $124,000 remaining in the Treasury. Care was extended so far as it was possible to all who needed relief. Not only were the destitute fed, but the domestic animals were also transported, when required, to places of safety and fed.

Medicines to the value of $128 were purchased and distributed at New Orleans. The amount is included in the expenditures. A large quantity of seeds received from the Department of Agriculture was also distributed.

The sum expended, including the purchase of supplies and all transportation and incidental expenses, was $76,009.47.

In addition to the foregoing, the sum of $7,637.97 was expended by the Quartermaster's Department for the purchase of tents, under authority of the joint resolution of Congress approved March 24, 1897. These tents, however, remain the property of the Government and are available for other purposes. The expenses incurred in the distribution and collection of the tents amounted to $1,092.72, which, added to the above-mentioned sum of $76,009.47, makes the total cost of relief extended to the flood sufferers $77,102.19.

MEDICAL DEPARTMENT.

WAR DEPARTMENT, SURGEON-GENERAL'S OFFICE,
Washington, October 18, 1897.

SIR: I have the honor to submit the following summary of my annual report for the year ended June 30, 1897:

During the year there was expended under the laws relating to artificial limbs the sum of $555,347.51. The appropriation for the current year is $183,000 and the estimate for 1898–99 $125,575. These benefits to disabled pensioners recur every three years, and as the cases on the rolls are not evenly distributed over the years the annual expenditures vary.

There remained in service in the Hospital Corps June 30, 1897, 98 hospital stewards, 99 acting hospital stewards, and 513 privates, a total of 710 men. The company of instruction at Washington Barracks received 46 men during the year, and from it 42 trained men were sent to other posts.

From the appropriation of $140,500 for the expenses of the Medical Department of the Army for 1896–97 the sum of $86,092.96 was expended, leaving a balance of $54,417.24, of which about $30,000 will be required for payment for supplies contracted for and other obligations incurred prior to July 1, 1897. The appropriation for the current year is $135,200, and the estimates for 1898–99, $125,200. During the year an investigation was made into the efficiency of the medicinal tablets issued

from the supply depots. The results were satisfactory as showing the value of the tablets when properly administered.

Twenty-five officers and 106 enlisted men were treated in the Army and Navy General Hospital, Hot Springs, Ark., during the calendar year 1896. On my recommendation, in May last, the benefits of this hospital were extended to honorably discharged soldiers and sailors of the Regular and Volunteer Army and Navy of the United States. Since then only 13 individuals belonging to the classes mentioned have taken advantage of the privilege, but when the authority for their admission for treatment becomes generally known there is no doubt that many veterans of the war will become applicants for admission.

The estimates for the library of the Surgeon-General's Office for 1898–99 contain a special call for an appropriation of $6,000 to provide additional shelving rendered necessary by the steady growth of the library. In the museum there are now 36,897 specimens; in the library, 123,924 volumes and 210,152 medical theses and pamphlets. Two deaths and six retirements of medical officers occurred during the year. Three of the vacancies thus occasioned were filled by competitive examinations in October, 1896, leaving five vacancies at the end of the fiscal year.

The total number of men examined for enlistment during the calendar year was 14,659, of whom 8,654, or 590.35 per thousand, were accepted. This ratio is considerably larger than the rates of previous years.

There are now in the files of the identification branch of this office data sufficient for the detection of 12,640 men whose records show them to be undesirable as soldiers.

The health of the Army was excellent during the calendar year 1896. The admissions to sick report per thousand of strength were 1,110.39, as compared with 1,110.22 in the previous year. The average length of time each case was under treatment was 11.19 days, as compared with 11.14 in 1895 and 11.69 as the average of the previous decade. The number of days lost on account of sickness for each man in the Army was 12.43 days, as compared with 12.37 in the previous year and 14.93 the average of the previous decade. The number constantly noneffective per thousand of strength was 33.97, as compared with 33.89 in 1895 and 40.92 the average annual rate of the decade prior to 1895. The discharge rate for disability was 10.15 per thousand of strength, as against 9.15 in the previous year and 21.77 in the previous decade. In those ten years a higher nonefficient rate prevailed, notwithstanding the considerably larger number of men discharged from the ranks on account of persisting disability. The death rate from all causes constituted only 5.44 per thousand of the strength.

Great improvement has taken place in the past few years in the sanitary condition of the colored troops, as manifested by their lessened rates of sickness, disability, and death. The nonefficiency from all causes among the colored troops during the year was 25.75 per thousand of strength, as compared with 34.72 among the white troops. The colored soldier lost 9.42 days from disability during the year, the white soldier, 12.71; and the average time of treatment or each case was, among the colored troops, 10.84 days; among the whites, 11.22 days.

The largest admission rates for the year were reported from Washington Barracks, D. C., and Fort Myer, Va. Fort Yellowstone, Wyo., had the best medical record.

During the year a systematic investigation was made into the diagnostic value of

Widal's serum test in cases presenting the clinical characteristics of typhoid fever. The results were satisfactory as showing not only the value of the test, but as indicating the probability that the fevers heretofore reported as Texas fever, Florida fever, etc., were in reality cases of typhoid fever.

Many valuable reports of surgical cases and operations are submitted, including 79 cases of hernia operated on by army surgeons for radical cure.

The quarters provided for the enlisted men at posts recently built are excellent in their sanitary arrangements. At some of the old posts the buildings are more or less in want of repair, sometimes overcrowded, with inadequate ventilation and primitive methods for the removal of wastes. Every year, however, shows some improvement in the condition of these posts.

On account of the insanitary condition of the quarters occupied by married soldiers at many of our posts, I recommend a return so far to former methods as to provide public quarters for a limited number of married men in each organization, all others being strictly prohibited from having their families at the post. A provision of this kind would be regarded as a privilege awarded to deserving soldiers, and would permit the whole of the huts and shanties now occupied to be destroyed.

The water supplies of our military posts have been carefully studied by medical officers with the view of preventing the occurrence of typhoid fever.

The rations of the men have been reported as ample in quantity, well cooked, and of excellent quality. The milk supply of two posts was criticised adversely, and the reports in these instances are suggestive of the possibility of similar conditions at other stations. The emergency ration was tested on field service with Troop E, First Cavalry, in Oklahoma. The medical report of this test shows the value of the ration in sustaining the troops under conditions of emergency.

Respectfully submitted.

GEO. M. STERNBERG,
Surgeon-General, U. S. Army.

Hon. RUSSELL A. ALGER,
Secretary of War.

In April, 1897, the Hon. H. C. Lodge, United States Senator, made application to the Department for the admission to the Army and Navy General Hospital at Hot Springs, Ark., of a veteran of the late war, who was afflicted with rheumatism. A consideration of the subject disclosed the fact that under the regulations governing admission to that hospital, as originally prescribed, discharged soldiers were not eligible to admission. It appearing from the records that while the hospital was capable of caring for 79 patients, there were, as a rule, from 30 to 50 vacant beds; the regulations were therefore amended by the President, so as to authorize the admission of suitable cases from among the discharged soldiers of the Regular and Volunteer Armies who are suffering from disabilities contracted in the service.

The statistics relating to the health of the Army are interesting.

The general impression that white troops excel colored troops in point of health is shown to be contrary to the facts.

The Surgeon-General recommends a return to the former practice of providing public quarters for a stated number of married men in each organization. This on account of the unsanitary condition of their present quarters at many posts. While there is force in his suggestion, the enlistment of married men is discountenanced because of the frequent liability to change of station, and to build quarters as recommended would add largely to the expense, and indirectly encourage that which is not favored by the military authorities.

The Subsistence and Medical Departments submit favorable reports on the emergency ration after a practical test in the field.

PAY DEPARTMENT.

WAR DEPARTMENT, PAYMASTER-GENERAL'S OFFICE,
Washington, October 15, 1897.

SIR: I have the honor to submit the following summary of my annual report for the year ended June 30, 1897:

(1) A general statement of receipts and expenditures for the year ended June 30, 1897.

(2) Statement of collections in favor of other bureaus of the War Department.

(3) Recapitulation, by years, of soldiers' deposits, showing increase in number and aggregate amount of deposits.

(4) Analytical statement of mileage disbursed during the year, and requesting legislation to relieve paymasters and other officers who, under orders and decisions of the War Department, were required to pay full fare over 50 per cent railroads, and, having paid the same, have had the amounts disallowed by the Auditor for the War Department, under a decision of the Comptroller of the Treasury, that but 50 per cent of the cost of travel fare over such roads should have been paid by the officer or reimbursed by the paymaster.

(5) Deficiencies showing that a further appropriation of $95,927.45 is required to complete payment of the Army for the year ended June 30, 1897. It also appears probable that a further appropriation of not less than $450,000 will be required to enable the Army to be paid in full for the fiscal year ending June 30, 1898.

There is an increase in the estimate for the next year over the appropriation for the year ending June 30, 1898, of $858,112.99, accounted for as follows:

The estimates for 1898 were very closely made, yet Congress reduced the estimate $439,951.90, which will in part account for the apparently large increase in the estimates for 1899.

The principal items of increase are as follows:

In the pay of officers of the line, $128,879.24, the estimate is based on the full number of officers in the service, and on the fact that there will be at least 45 additional second lieutenants to be provided for at a cost of $65,000.

The increase of pay of enlisted men for length of service is $292,702. This estimate is based on the amount expended during the past fiscal year, and on information furnished by the Adjutant-General of the Army, and is caused by the fact that by act of March 16, 1896, deduction on account of retained pay ceased, and the soldier is now paid the entire amount due him each month.

The increase in pay of retired officers is $179,454.18.

This estimate is based on the number of officers reported by the Adjutant-General. In estimating for this item, to the number of retired officers now on the list is added those to be retired during the fiscal years 1898 and 1899.

The increase on account of pay of enlisted men on the retired list amounts to $126,150.50. This estimate is based on the number of retired enlisted men reported by the Adjutant-General July 1, 1897, and the probable number that will be retired during the fiscal year 1898.

The increase on account of travel pay, retained and detained pay, clothing not drawn, and interest on deposits payable to enlisted men on discharge amounts to $74,376.72.

This estimate is based on the amount and number of men paid during the past year and the number to be paid in 1899. Owing to the fact that two enlistment periods expire in the fiscal year 1899, the amount to be paid on account of clothing, travel pay, etc., will require the additional amount asked for.

As the Army has been maintained during the year 1897 at nearly its maximum strength, or within one man per company, it is essential that the amount estimated for be appropriated. It would save much embarrassment to the Department if deficiency estimates could be avoided and payments to the Army made when due.

It is urged that, as the estimates have heretofore exceeded the actual disbursements by little more than 1 per cent (which is scarcely enough to afford such a working balance as to enable the Army to be paid promptly and in full), the whole amount estimated for be appropriated by Congress.

(6) *Payments of the Army.*—All military posts in the country have been paid monthly.

(7) *System of payments.*—The labor of payment under the present system has been largely increased, while no corresponding benefit to the service has accrued. Serious objections to the system are urged by paymasters, among which are the vexatious delays to which they are subjected in the rendition of their accounts by reason of the necessity of transmission of rolls back and forth between them and company officers for the correction of errors which could be corrected at the pay table were the paymaster present.

The most serious objection is that the paymaster is required to turn over to non-bonded officers, for disbursement, the funds for which his sureties guarantee the Government against loss. It is believed that if this fact were generally known paymasters could not easily find individuals or companies to become their sureties.

(8) Recommending a general disbursing bureau for the Army, for the reason that greater economy and simplicity would result therefrom than can obtain where the appropriations for the support of the military establishment are divided among several bureaus, of which not all the officers charged with disbursements are bonded. No disbursements should be permitted by other than bonded officers, and with all disbursing officers under the control of one bureau greater economy, simplicity, and promptness must necessarily follow.

This system prevails in some of the great armies of Europe, and meets with the approval of officers of experience and high rank in our own. In the interests of the public service I recommend that legislation to this effect be requested of Congress.

(9) *Clerks to army paymasters.*—I recommend that paymasters be permitted to select their own clerks, and that they have periodical increase of pay until a maximum of $1,800 per annum is reached. They are the trusted and confidential assistants of bonded officers who disburse more than $13,000,000 per annum. They were formerly selected by the paymasters themselves, because of personal knowledge of their ability and integrity, but are now appointable only under the rules of the civil service. In consideration of the close confidential relation they bear to the paymaster, who is responsible for any loss that may occur through his clerk, it is but just that the paymaster be permitted to make his own selection, subject only to the approval of the Secretary of War; and as their duties are arduous and responsible, requiring ability and faithfulness beyond the average, and to place them on an equality with clerks in other branches of the military service, it is recommended that they be granted by Congress an increase in pay for each five years' service until a maximum of $1,800 per annum is reached.

(10) *Retirements and appointments in the Pay Corps.*—One paymaster (colonel) has been placed on the retired list, and two paymasters (majors) have been appointed—both appointments from the Army.

Very respectfully,

T. H. STANTON,
Paymaster-General, U. S. Army.

The SECRETARY OF WAR.

The legislation to relieve paymasters and other officers from amounts disallowed by the Auditor under a recent decision of the Comptroller relative to travel over certain roads known as "50 per cent railroads" is earnestly recommended.

To the remarks of the Paymaster-General as to deficiencies in appropriations and the reasons for the increase in his estimates, I ask careful and favorable consideration. To his criticism of the present system of payments and his views as to clerks to paymasters, I invite attention.

ENGINEER DEPARTMENT.

OFFICE OF THE CHIEF OF ENGINEERS,
UNITED STATES ARMY,
Washington, D. C., October 14, 1897.

Mr. SECRETARY: In compliance with your instructions I have the honor to present the following brief synopsis of my annual report for the fiscal year ending June 30, 1897, which was submitted to you under date of September 30, and to which attention is respectfully invited:

OFFICERS OF THE CORPS OF ENGINEERS.

At the close of the fiscal year the Corps of Engineers consisted of 111 officers, 18 of whom were detached from the command of the Chief of Engineers and on duty

at the United States Military Academy, with the Light-House Establishment, with the Commissioners of the District of Columbia, and at the Yellowstone National Park.

The other officers of the corps were busily engaged during the year in charge of important public works connected with permanent fortifications, improvement of rivers and harbors, construction and repair of light-houses, public buildings and grounds in the District of Columbia, Washington Aqueduct, as members of boards of engineers, the Mississippi River Commission, the Missouri River Commission, the California Débris Commission, the torpedo system of defense, and on duty with the Battalion of Engineers and the Engineer School at Willets Point, N. Y.

The important duties devolving upon the Corps of Engineers, together with the expenditure of the great sums appropriated for public works, render it necessary to divide the country into a number of engineering districts, and to place upon the district officers large and varied duties demanding the highest order of ability, industry, and integrity.

There is an urgent need for an increase in the number of engineer troops, both officers and enlisted men. The present authorized strength should be increased by an additional battalion, each company of both battalions to consist of 150 enlisted men officered by one captain and three lieutenants; each battalion should be commanded by a major and the two battalions by a colonel; this would necessitate an increase in the number of officers of the Corps of Engineers. With this increase the engineer regiment should be distributed on the Western, Eastern, and Southeastern coasts in connection with fortifications, torpedo defenses, etc., and the troops should be placed on the same basis as other troops of the line, so that the officers connected with the regiment should have the right to command according to their rank when thrown on duty with other branches of the service.

SEACOAST DEFENSES.

In accordance with the recommendations of the board on fortifications and other defenses appointed by the President under the provisions of the act of March 3, 1885, the Secretary of War has approved detailed projects for the modern artillery defense of the following localities:

1. Penobscot River, Maine.
2. Kennebec River, Maine.
3. Portland, Me.
4. Portsmouth, N. H.
5. Boston, Mass.
6. New Bedford, Mass.
7. Narragansett Bay, Rhode Island.
8. Eastern entrance to Long Island Sound.
9. New York, N. Y.
10. Philadelphia, Pa.
11. Baltimore, Md.
12. Washington, D. C.
13. Hampton Roads, Virginia.
14. Wilmington, N. C.
15. Charleston, S. C.
16. Savannah, Ga.
17. Key West, Fla.
18. Pensacola, Fla.
19. Mobile, Ala.
20. New Orleans, La.
21. Galveston, Tex.
22. San Diego, Cal.
23. San Francisco, Cal.
24. Mouth of Columbia River, Washington and Oregon.
25. Puget Sound, Washington.
26. Lake Champlain, New York.

The first appropriation for the construction of modern gun and mortar batteries was made by the act of August 18, 1890. The following table shows the various amounts appropriated for this purpose up to the present time:

Act of—		Act of—	
August 18, 1890	$1,221,000	March 2, 1895	$500,000
February 24, 1891	750,000	June 6, 1896	2,400,000
July 23, 1892	500,000	March 3, 1897 *a*	3,841,333
February 18, 1893	50,000		
August 1, 1894	500,000	Total	9,762,333

Under allotments made from the above appropriations, emplacements for modern guns and mortars have been constructed or are now under construction at 22 localities as follows:

1. Portland, Me.
2. Portsmouth, N. H.
3. Boston, Mass.
4. Narragansett Bay, Rhode Island.
5. Eastern Entrance, Long Island Sound.
6. New York, N. Y.
7. Philadelphia, Pa.
8. Baltimore, Md.
9. Washington, D. C.
10. Hampton Roads, Va.
11. Wilmington, N. C.
12. Charleston, S. C.
13. Savannah, Ga.
14. Key West, Fla.
15. Pensacola, Fla.
16. Mobile, Ala.
17. New Orleans, La.
18. Galveston, Tex.
19. San Diego, Cal.
20. San Francisco, Cal.
21. Mouth of Columbia River.
22. Puget Sound.

The aggregate of $9,762,333 thus far appropriated under the various acts of Congress for construction of gun and mortar batteries has provided for the following emplacements:

12-inch.	10-inch.	8-inch.	Rapid-fire.	12-inch mortars.
24	82	33	16	232

The total armament proposed under the present projects for coast defense comprises a total of about 32 16-inch guns, 200 12-inch guns, 180 10-inch guns, 100 8-inch guns, 250 heavy rapid-fire guns, 1,032 12-inch mortars, and 24 10-inch mortars. These figures are subject to slight changes as the work progresses, but show approximately the total armament that will be required for an adequate defense of our sea and lake ports. It will be observed that Congress has thus far provided for 139 emplacements for 8, 10, and 12 inch guns out of a total of about 480 required under present projects, and for 232 mortar emplacements out of a total of about 1,056 required.

The aggregate of all appropriations for gun and mortar emplacements prior to the act of June 6, 1896, amounts to $3,521,000. At the beginning of the fiscal year these funds had either been expended or allotted for the following emplacements:

12-inch.	10-inch.	8-inch.	Rapid-fire.	12-inch mortars.
8	21	7	2	80

a Of this appropriation $2,500,000 was for contracts authorized under act of June 6, 1896.

The acts of June 6, 1896, and March 3, 1897, carried appropriations for gun and mortar batteries amounting to $6,241,333, or nearly double those of all previous acts combined. The following summary shows the emplacements that have been provided under the last two acts:

	12-inch.	10-inch.	8-inch.	Rapid-fire.	Mortars.
Act of June 6, 1896	13	53	23	14	88
Act of March 3, 1897	3	8	3	.....	64
Total	16	61	26	14	152

The emplacements provided under the act of June 6, 1896, are being constructed partly by hired labor and partly by contract, under that clause of the act which provides:

That contracts may be entered into, under the direction of the Secretary of War, for materials and work for construction of fortifications, to be paid for as appropriations may from time to time be made by law, to an additional sum in the aggregate not to exceed two million five hundred thousand dollars.

At the close of the fiscal year the following guns and mortars were mounted and in readiness for service:

12-inch.	10-inch.	8-inch.	Mortars.
10	18	5	73

In addition, there were completed and ready for armament on the same date the following emplacements:

12-inch.	10-inch.	8-inch.	Rapid-fire.	Mortars.
4	29	4	6	39

At the close of the calendar year it is expected that there will be completed, armed, or in readiness for armament the following emplacements:

12-inch.	10-inch.	8-inch.	Rapid-fire.	Mortars.
19	60	31	9	168

It is expected that the remainder of the emplacements so far provided for will be completed by July 1, 1898, by which time all funds for gun and mortar emplacements will be practically exhausted.

The acts of June 6, 1896, and March 3, 1897, appropriated $100,000 and $150,000, respectively, for submarine mine defenses. These appropriations have been or are being expended, partly in the construction of mining casemates, cable tanks, and torpedo storehouses, and partly in the purchase of such submarine mine material as is not subject to rapid deterioration, and which can not be procured rapidly in an emergency.

The appropriations of $500,000 and $300,000, respectively, in the acts of June 6, 1896, and March 3, 1897, for the purchase of sites for seacoast defenses have either

been expended or pledged. The sites needed to accommodate projected batteries are being procured either by direct purchase from the owners whenever reasonable prices are offered, or by condemnation proceedings instituted by the Department of Justice.

ESTIMATES.

The estimates for the engineering work of seacoast defenses for the fiscal year ending June 30, 1899, are:

For gun and mortar batteries	$5,000,000
For submarine mine defenses	150,000
For sites	500,000
For preparation of plans for fortifications	5,000
For protection, preservation, and repair of fortifications	100,000
For sea walls and embankments	55,000
Total	5,810,000

UNITED STATES ENGINEER SCHOOL.

The object of the United States Engineer School at Willets Point, N. Y., is to provide a post-graduate course in engineering for the young officers of the Corps of Engineers, and to give them practical instruction in their duties with engineer troops, in submarine mining, and in higher civil and military engineering, in order to better fit them for the important and responsible work which devolves on the Corps of Engineers. Selected officers from other branches of the service are also detailed for instruction in submarine mining. The present course for engineer officers is three years, and for officers of other arms one year. The garrison consists of three companies of engineer troops, under the battalion commander. The advantages offered by the school in training young engineer officers for their future duties and in imparting a knowledge of the adopted submarine-mine system to officers of other arms are of the greatest importance.

Attention is invited to the estimate of $41,000, presented in detail in my report of September 30, for the engineer depot and school at Willets Point.

RIVERS AND HARBORS.

The condition of the various works for the improvement of rivers and harbors carried on under appropriations made by Congress is given in detail in my report for the past fiscal year.

The total amount actually expended for the improvement of rivers and harbors during the fiscal year ending June 30, 1897, is as follows:

For general improvement of rivers and harbors	$10,612,268.75
For removal of wrecks	35,158.51
For operating dredge boats and snag boats	136,260.56
For operating canals and other works of navigation	678,253.00
For work under Mississippi River Commission	1,595,975.98
For work under Missouri River Commission	387,326.39
For gauging waters of the Lower Mississippi River and its tributaries	6,145.83
For examinations and surveys of South Pass, Mississippi River	*a* 10,006.50
Total	13,461,395.52

a This amount is exclusive of the sum paid the executors of the estate of James B. Eads for "constructing jetties and other works at South Pass, Mississippi River."

Since the last report was submitted appropriations for rivers and harbors have been made by the sundry civil act of June 4, 1897, and the deficiency act of July 19, 1897, the former providing $19,121,412.91 and the latter $1,211,000 for the fiscal years ending June 30, 1897 and 1898.

The total estimate submitted for the fiscal year ending June 30, 1899, for continuous work authorized by Congress and by the Secretary of War is $18,098,007.56. None of this amount has yet been expended, but, as permitted by law, a portion of it has possibly been earned by contractors in advance of its appropriation. The items making up this amount are such as Congress has authorized to be expended during the year ending June 30, 1899, at the various localities for which continuing work is authorized, and Congress has virtually pledged itself to provide the amounts for which requisition is made.

In addition to the estimate submitted for work under continuing contracts, an estimate is presented for the construction and maintenance of works which have been authorized by Congress, but not provided for by such continuing contracts, amounting to $30,630,153. The items making up this amount are those presented for the various works by the engineer officers in local charge as the amounts that should be appropriated, under the law requiring that the amount shall be stated which can be profitably expended in carrying on the projects adopted by Congress, during the fiscal year ending June 30, 1899. The use of the estimates of the local officers in making up this total is in accordance with your instructions, and the estimates are submitted in accordance with the requirements of sections 2 of the river and harbor acts of 1866 and 1867 and the sundry civil act of June 4, 1897, which provide—

* * * And it shall be the duty of the said Secretary * * * and he shall accompany said report with a statement of the amount and date of all former appropriations for each work, and a full estimate for its entire and permanent completion, with the amount that can be profitably expended in the next fiscal year. * * * (Act of June 23, 1866, and repeated in act of March 2, 1867.)

* * * And hereafter the Secretary of War shall annually submit estimates in detail for river and harbor improvements required for the ensuing fiscal year to the Secretary of the Treasury, to be included in, and carried into the sum total of, the Book of Estimates. (Sundry civil act of June 4, 1897.)

The act of June 3, 1896, authorized the Secretary of War to enter into contract for the completion of a number of works, and contracts have already been made, or the required preliminary steps to that end have been authorized, excepting in two instances, as follows:

Improving Yaquina Bay, Oregon, continuing improvement, $25,000. Continuous contracts authorized at cost not to exceed $1,000,000.

Improving mouth of Yazoo River and Harbor at Vicksburg, Miss. Continuous contracts authorized at cost not to exceed $860,000.

The act of June 3, 1896, provided for the appointment of a board to examine and report as to location for a deep-water harbor for commerce and of refuge at Port Los Angeles, in Santa Monica Bay or at San Pedro, Cal. This board was duly constituted, and its report, submitted to Congress, was printed in Senate Doc. No. 18, Fifty-fifth Congress, first session. The board reported in favor of locating the harbor at San Pedro, and the Secretary of War, under the terms of the act, has given instructions for action preliminary to the publishing of advertisement inviting bids for the work.

The unprecedented high water which accompanied the flood of 1897 in the Mississippi River severely tested the levees constructed, and the information at hand

shows that of an approximate length of levees of 1,377 miles on the two banks of the river between Cairo and the Head of the Passes the breaks aggregated in length only 8.7 miles, or about 0.63 of 1 per cent of the whole length. None of the levees built by the United States, however, were broken.

The policy of the Mississippi River Commission having been modified to provide for greater work in dredging, two powerful hydraulic dredges have already been constructed and are in operation, and contracts have been made for the construction of four more.

The Missouri River Commission again calls attention to the fact that the progress of work for the systematic improvement of the river by continuous work by reaches is seriously interfered with by requirements of law which specify numerous localities, separated by many miles, where work is required to be done, notwithstanding a reduction in the money provided by Congress for the work. The results obtained on this river have shown beyond question the practicability of controlling the river, holding its banks, and giving ample channels for navigation; but the cost and uncertainty of permanence of the work and the slow progress heretofore made have been such as to discourage those interested in the effort to improve the river for such a distance as would give promise of building up its commerce to a degree commensurate with the cost of the work.

During the year the channel through the Great Lakes between Chicago, Duluth and Buffalo was practically completed, and its importance to the interests of navigation is enormous.

The commerce passing through the St. Marys Falls Canal during the navigable season of 1896 comprised 16,239,061 tons of freight, valued at $195,146,842, and through the Detroit River about 27,900,520 tons, valued at $300,000,000.

The commerce of the Great Lakes has increased so enormously that accurate charts can only be procured by constant examinations and surveys of new shoals as they become known, and corresponding corrections of and additions to the engraved plates; therefore the appropriations asked for these purposes are recommended.

WASHINGTON WATER SUPPLY.

The subject for the pressing necessities for providing the city of Washington with an increased supply of water is again presented for the consideration of Congress, and the matter is one which can not, with justice to the citizens of the capital, be much longer delayed. The estimates for the work will be found in my annual report, and it is recommended that favorable action be taken by Congress during its present session.

ARLINGTON MEMORIAL BRIDGE.

The sundry civil act of June 4, 1897, made provision for surveys, etc., for a memorial bridge from the old Naval Observatory grounds in this city to Arlington National Cemetery, and operations under this provision of law are being carried on as rapidly as circumstances will permit.

DEEP WATERWAYS BOARD.

The sundry civil act of June 4, 1897, also provided for the appointment of a board to make such surveys and examinations of deep waterways between the Great Lakes and the Atlantic tide waters as recommended in the report of the Deep Waterways

Commission transmitted to Congress January 18, 1897. The board has been constituted by the appointment of Maj. Chas. W. Raymond, Corps of Engineers, and Messrs. Alfred Noble and George Y. Wisner, civil engineers, and is now engaged in the duties assigned under the provisions of the act.

ARANSAS PASS BOARD.

The board of engineer officers to be appointed under the provisions of the sundry civil act of 1897, to ascertain the character and value of the improvements made at Aransas Pass, Texas, was duly constituted and is now engaged in the performance of the duty imposed, and it is expected that the examination of this subject will be completed in time to permit its report to be submitted to Congress on the first Monday in December next, as required by the act.

PUBLIC BUILDINGS AND GROUNDS IN WASHINGTON, D. C.

The improvement of public buildings and grounds and maintenance of the Washington Monument have been carried on under appropriations made by Congress, and, as far as funds permitted, the work has progressed in such manner as to secure the best results. The estimates for this purpose for the coming fiscal year are given in detail in my annual report, and amount to $250,631.

MILITARY MAPS.

Special attention is invited to the item relative to the compilation and publication of military maps for use of the War Department, and particularly those required in connection with harbors adjacent to new fortifications. An appropriation of the small amount asked for is strongly recommended.

Very respectfully, your obedient servant,

JOHN M. WILSON,
Brig. Gen., Chief of Engineers, U. S. Army.

The SECRETARY OF WAR.

The foregoing concise statement clearly summarizes the important work committed to the charge of the Corps of Engineers.

The time seems to have arrived when an increase in the number of officers and enlisted men of that corps is indispensable. The immense work intrusted to a few men is overtaxing, and it is believed a great saving of money in securing efficient and thorough work by contractors in fulfillment of their contracts would be effected by detailing a young officer to remain on each work under construction or improvement to see that day by day all material as purchased, both in quality and quantity, and according to specifications, is furnished. It is absolutely impossible for one man, having a large number of works a long distance apart, to constantly supervise the construction of improvements in his charge. This is one special reason why it is believed that an increase of cadets at West Point will be beneficial, as more than formerly can be assigned to the Engineer Corps and profitably employed, while the experience

thus gained will be of great benefit to them in future years in the line of their profession.

I invite attention to the remarks of the Chief of Engineers on the subject of seacoast defenses, in which he gives the progress of the work on gun and mortar batteries and emplacements. Seacoast defenses are being rapidly constructed, and they should be completed at the earliest possible date. I can not emphasize this too strongly, and therefore urge that the full amount of the estimate be appropriated.

The estimates for river and harbor improvements submitted by the Chief of Engineers have been prepared in accordance with the requirements of law. (Acts of June 23, 1866; March 2, 1867, and June 4, 1897, quoted by him.) They greatly exceed former estimates, and, while I hesitate to express an opinion in matters so fully within the knowledge of members of Congress, I can not refrain from stating the result of my observations since my connection with the Department. It is true that I have not had an opportunity to make a personal inspection of many of the works in question, yet with the exception of waterways and harbors where there is a large traffic, or where immediate improvement is imperatively needed, I am convinced that the estimates are largely in excess of what they should be at a time when the demands upon the Treasury are as great as now. It is therefore recommended that the amount to be appropriated be largely reduced below the estimates. It is but just to the Chief of Engineers to state that these estimates were made by my direction, that the facts might be placed before Congress, showing what the expenditures would be were all the requirements of the above-cited laws complied with.

Special attention is invited to the fact that there are now continuous contracts outstanding that will require an expenditure of over $17,000,000 during the fiscal year ending June 30, 1899; of over $14,000,000 during the fiscal year ending June 30, 1900; $5,700,000 during the fiscal year ending June 30, 1901; $796,000 during the fiscal year ending June 30, 1902, and $345,000 during the fiscal year ending June 30, 1903. It is to be understood that these statements are of course approximate only, but they are believed to be nearly correct.

The total length of single levee line built by the United States on the two banks of the Mississippi River below Cairo does not vary materially from 650 miles, and it is gratifying to note that none of these levees were broken by the recent flood in the river. The breaks in the entire system of levees, approximating 1,377 miles in length on

the two banks of the river between Cairo and the Head of the Passes, constructed by the United States, the States, and individuals, aggregated only 8.7 miles, or about sixty-three one hundredths of 1 per cent of the entire system.

DEEP-WATER CHANNEL THROUGH THE GREAT LAKES.

The practical completion of the deep-water channel through the Great Lakes marks the beginning of a new era, and its benefits to the future commerce of the great Northwest, and, indeed, the whole country can be realized to some extent by the marvelous development of the commerce through the lakes in recent years. Without going into details, it will suffice at this time to repeat the statement of the Chief of Engineers that the commerce passing through the St. Marys Falls Canal, to and from Lake Superior alone, during the navigable season of 1896 comprised 16,239,061 tons of freight, valued at $195,146,842, and through the Detroit River, coming from Lakes Superior, Michigan, and Huron, about 27,900,000 tons, valued approximately at $300,000,000.

DEEP WATERWAYS BOARD.

In accordance with the act of June 4, 1897, a deep-waterways board was appointed, consisting of Maj. Charles W. Raymond, Corps of Engineers, U. S. A., Alfred Noble, of Chicago, and George Y. Wisner, of Detroit, with Gen. J. H. Kidd, of Ionia, Mich., as secretary. This board is now in the field and pushing its work forward as rapidly as possible.

SHIP CANAL CONNECTING LAKES UNION AND WASHINGTON WITH PUGET SOUND.

The work of securing the right of way for the canal free of cost to the Government is in progress. The dimensions of the canal as proposed by the Board of Engineers constituted under the provisions of the river and harbor act of September 19, 1890, which were based upon the size of merchant vessels then employed, are not deemed sufficient to accommodate vessels since built and to be built in the near future. It is thought to be desirable and important that an increase in the size of the locks and depth of channel in the canal sufficient to accommodate commerce and vessels of the United States Navy should be made, and the Secretary of the Navy has accordingly been requested to furnish information as to the depth and width that would be required to

afford accommodation to the vessels of the Navy and permit their passage between the Sound and the lakes, in order that the data may be at hand and available for consideration when the detailed plans for the work of construction are being prepared. The right of way now in progress of procurement will, it is believed, permit the increase of dimensions, but should additional right of way be found necessary, the same could probably be secured free of cost to the Government.

As the acceptance by the Secretary of War of the right of way must precede the preparation of detailed plans, it will yet be some time before active operations of construction can be commenced.

I can not too strongly recommend the construction of this canal. Lake Washington is a large sheet of fresh water with excellent banks. It is very deep and, of course, entirely free from tides. The necessity on that great coast of fresh water where sea-going vessels can be repaired and freed from barnacles is most apparent.

MONONGAHELA NAVIGATION COMPANY.

In pursuance of a provision contained in the river and harbor act approved June 3, 1896, proceedings for the condemnation of all the property and its appurtenances of the Monongahela Navigation Company, a corporation of Pennsylvania, were duly instituted through the Department of Justice in the United States circuit court for the western district of Pennsylvania. The value of said property, as estimated and determined by the viewers appointed by the court, amounted to $3,761,615.46.

The award as made by the viewers was accepted, and the Attorney-General, having been requested to inform the War Department as to the validity of title, expressed the opinion that the Monongahela Navigation Company was clothed with valid title to all of the tracts, subject, however, to a mortgage of $500,000, upon release of which and payment of the amount of the award valid title would vest in the United States. The mortgage referred to was executed to secure the payment of certain outstanding bonds issued by the company, and upon receipt of satisfactory evidence that said bonds had been canceled and paid, excepting bonds to the amount of $150,000, the sum of $160,000 from the amount of the award was retained to secure final payment thereof, and the balance, amounting to $3,601,615.46, was paid to the navigation company on July 8, 1897, thus opening the Monongahela River to free navigation for its vast commerce.

WASHINGTON AQUEDUCT.

An increased water supply for the city of Washington is an urgent necessity, as stated by the Chief of Engineers.

ORDNANCE DEPARTMENT.

OFFICE OF THE CHIEF OF ORDNANCE,
UNITED STATES ARMY,
Washington, D. C., October 15, 1897.

SIR: In compliance with your instructions of the 13th instant, I have the honor to submit herewith the following summary of my annual report for the fiscal year ended June 30, 1897, viz:

The variety and extent of the work covered by this report is so great that the report itself is hardly more than a summary of operations. A brief of the summary can be but a condensed statement of the principal heads of subjects.

A complete statement of the fiscal operations of the Department for the year is given.

The report states the action that has been taken under the act of Congress to provide for the distribution of caliber .45 rifles to the National Guard and Militia of the States and Territories, and shows that 24,564 Springfield rifles and 591 Springfield carbines have been issued.

It explains the necessity for additional legislation for making effective the act of Congress of last year to provide for sales of stores to the States, and makes recommendations.

The report gives a summary of some of the principal operations of the different arsenals, especially of the improvement of buildings and grounds, roads, railroads, sewers, water supply, but more especially of improvements of plant for manufacture.

A summary of these operations is of interest, but mention can be made of only a few items.

A small increase of plant for the manufacture of cartridges for small arms and for field and siege artillery ammunition has been made at the Frankford Arsenal. The report shows the great necessity for the transfer of this plant from the numerous old, small, detached, and insufficient buildings now occupied to the ample new building, built for the purpose many years ago, which has never been occupied. An estimate for this transfer is submitted in the annual estimates for next year, and is important.

At the Rock Island Arsenal considerable extensions of the plant for the manufacture of field and siege carriages have been made, and a report on the reconstruction and completion of the great bridge over the Mississippi River is given at length, and also an account of the repairs and improvement of the water power.

Most valuable work has been done at the Springfield Armory in the improvement of methods and appliances for the manufacture of small arms and in the efficient management of work, both for the reduction of cost and in the substitution of

machine for hand work, whereby accurate interchangeability of parts has been effected.

The report gives an interesting account of the operations of the testing department at Watertown Arsenal, especially of investigations and tests of structural materials of all kinds. The report of these tests is of importance to engineers and manufacturers, and better provision for early publication and a larger distribution is desirable.

The report is principally devoted to an account of manufactures, of important experiments in tests, the preparation of new designs and investigations, theoretical, technical, and experimental, of small arms of all kinds, small-arm ammunition, our new seacoast defense armament, including the guns and mortars. and their carriages of many types, projectiles and powders, the field and siege guns, the field and siege artillery ammunition, the various new types of rapid-fire guns with their mounts and ammunition, artillery harness, horse equipments and infantry and cavalry equipments of all kinds for the Army, their issue to the Army, their trials by troops and improvements based thereon, etc.

Some account of all these operations is given in the report, but the detailed technical information is contained in appendixes thereto. Attention especially is given in the report to improvements made in smokeless powders of all kinds for the various small arms, field and siege artillery and for the seacoast artillery, and to the establishment of the necessary facilities, knowledge, and experience in private manufactories for the large supply of these powders that might be required in time of war. The report is especially full on this subject. It is unfortunate that space will not permit even a mention of the subjects treated upon, except that it may be mentioned that the new breech mechanism for seacoast guns has been completed and is now under successful trial at the proving ground.

An important event is the successful completion of the first or type 12-inch disappearing carriage. This carriage is of the same general design as the service disappearing carriages for 8 and 10 inch guns already installed in the fortifications. It has been thoroughly tested, and is entirely satisfactory in all respects. (A portion of the tests were made in the presence of the Secretary of War.) The construction of such a carriage has heretofore been deemed impracticable. Its success effects a saving of many millions of dollars in the cost of the numerous emplacements for 12-inch guns and makes the service of these guns more efficient.

The forgings for the type 16-inch gun are in progress of manufacture. It has been deemed necessary, in order to meet specifications imposed, to use nickel steel for the tube and jacket, at an increase of cost, and the question arises as to whether compensation therefor should be made to the manufacturers, and it is recommended. Considerable space is given to a design for a new field gun of 3-inch caliber, of greatly increased velocity and some increase of power, and giving flatter trajectory; and in connection with designs for a carriage for this gun the important subject of means for checking the recoil of high-power field guns is considered and is under investigation and trial. Among the many experiments with small arms and small-arm ammunition, only one can be mentioned.

Extensive experiments for two years have been made for determining with

accuracy the trajectory of the caliber .30 magazine rifle, the remaining velocities, drift, and elevation and angle of fall of the trajectory at all points, and the deviation due to winds of varying velocity. Some of the important data necessary for the computation of trajectories has been successfully determined. These experiments involve difficulties and include the firing of some 16,000 rounds. The question of a new revolver of larger caliber, to produce a greater shock and of simpler construction, is treated at length.

An account of the manufactures and a statement of quantities manufactured at the different arsenals is given. The number of seacoast guns manufactured was about 50 per cent more than in any preceding year, and a saving of cost of finishing and assembling of about 20 per cent has been effected. An account is given of the accurate and excellent construction of saddletrees by machinery at the Rock Island Arsenal.

Of other manufactures, mention can be made of only a few items. Thirty-two thousand caliber .30 magazine rifles and carbines, model 1896, have been completed. This product was interfered with by delays in procuring suitable steel for barrels. About 15,400,000 ball and blank cartridges of all kinds were manufactured at the Frankford Arsenal; 6,800,000 of these were caliber .30 cartridges, and of these 5,900,000 have been issued to the Army.

Thirty-four carriages for seacoast guns were made during the year at the Government carriage factory at Watertown Arsenal and under contract. This rate of production will be greatly increased during the present year. Of the above, 30 are the service disappearing carriages invented and designed by Col. A. R. Buffington and Capt. William Crozier, officers of the Ordnance Department. These have been installed in fortifications as fast as completed, and their trial by troops in the fortifications has proved entirely successful.

Field and siege carriages were manufactured at the Rock Island Arsenal, as follows: Nine 3.2-inch gun carriages, eighty-four limbers, fifty-eight caissons, and seven forge and battery wagons; six 5-inch siege gun carriages, nineteen 7-inch howitzer carriages, and four limbers, and the equipments for these carriages. Among the principal articles of equipments manufactured at the same arsenal there is included 3,500 saber belts, 2,500 revolver holsters, 10,000 blanket bags, 5,000 each of haversacks, meat cans, and tin cups, 3,500 waist belts, 5,000 each of bridles and saddles, 6,670 carbine scabbards, 5,100 saddles, 15,350 breech-mechanism covers for magazine rifle and carbine, 200 arm racks, parts of 200 sliding targets, and 119,000 paper targets.

A portion of the report is devoted to explanation of and reasons for the new estimates submitted in the annual estimates for the year.

One of the most important items is that for powder and projectiles for seacoast guns. For these only small appropriations have been made heretofore, with the understanding that their production could be hastened in time of emergency, and in preference therefor appropriations have been made for guns and carriages, the manufacture of which could not be hastened. Nothing, however, can now be more important than a supply of powder and projectiles (especially the latter) for the guns already mounted.

A brief summary of the estimates for armament of fortifications is as follows:

ARMAMENT OF FORTIFICATIONS.

Appropriated by Congress for the fiscal year ending June 30, 1898 (new appropriations)	$3,167,732
Appropriated by Congress for the fiscal year ending June 30, 1898 (to meet payments falling due for work authorized in the fortifications bill of the preceding year)	1,695,076
Total	4,862,808
Estimates for the fiscal year ending June 30, 1899	7,468,051
Difference	2,605,243

As has been explained to Congress each year, this last estimate is made up as follows:

1. For guns the estimate includes the number of forgings required to keep the Gun Factory employed to nearly its capacity, and includes the amount required for finishing and assembling the guns at the factory.

2. The estimate includes what will be required for making payments to the Bethlehem Iron Company under its contract for furnishing guns. Although, fortunately, the Department has guns on hand, the production of guns should not fall below our capacity, because these guns are now being mounted more rapidly than they can be produced, and the rate of production can not be increased when the few on hand are exhausted.

3. The estimate includes enough carriages to meet the requirements of the Chief of Engineers for mounting carriages as the fortifications are completed, and about two-thirds the number of mortars and mortar carriages the Chief of Engineers requires for arming the fortifications.

4. The estimate for powder and projectiles is for a much less amount than is required for furnishing the complement of projectiles and powder required for the guns and mortars already mounted.

5. The estimate includes the number of rapid-fire and machine guns and their mounts, and a partial supply of ammunition, that the Chief of Engineers informs me will be absolutely necessary for mounting in the fortifications during the year.

6. The estimate includes items, than which nothing can be more important, to provide for a small gradual production of a reserve of field and siege artillery.

7. The estimate provides for the necessary expenses of the Sandy Hook proving ground, and for some most necessary and important improvements of the plants at the gun factory at Watervliet Arsenal, the gun-carriage factory at the Watertown Arsenal, and the field and siege carriage plant at the Rock Island Arsenal.

All of these estimates have been cut down to the lowest figure consistent with such an efficient and economical prosecution of the work as the action of Congress and discussions of preceding years indicate that the country and Congress desire.

On all of the items, however, except that for finishing and assembling guns and for the improvement of plants, the estimates are somewhat enhanced in consequence of the very great reductions of appropriations below estimates which were made by Congress at its last session.

The estimate for ordnance and ordnance stores and supplies of all kinds for the Army, and especially to provide stores and materials for target practice of artillery, infantry, and cavalry, amount to $1,156,000. Four hundred thousand dollars of this is for small arms. The appropriations for this purpose last year were $1,119,000. The slight increase of $37,000 in the estimates over the appropriations of last year is mainly for the accumulation of a reserve supply of ammunition and other stores that may be required in case of emergency.

The estimates for repairs, extension and improvement of plant, and erection of new buildings at all the arsenals amount to $422,000 more than the appropriations of last year. About one-half of this is for a new plant for the construction of siege and field carriages required at the Rock Island Arsenal, and for commencing the erection of the few buildings still required to complete the original plans for that arsenal. Among these is a hospital, which is deemed an absolute necessity at that post.

Other considerable items are for new buildings and extension of plant required at the Watertown Arsenal, the Frankford Arsenal, Springfield Armory; for some extensive and very necessary repairs for the preservation of the important powder depot of the Mississippi Valley, near St. Louis, and about $12,000 for a new testing machine at the Watertown Arsenal. The necessity for the estimates for the Frankford Arsenal and the Watertown Arsenal are stated at length both in the estimates and in the annual report.

Very respectfully, D. W. FLAGLER,
Brigadier-General, Chief of Ordnance.

The SECRETARY OF WAR.

I can not too strongly urge that the amount of the estimates of the Chief of Ordnance should be appropriated. The providing of adequate seacoast defenses, while expensive now, will cease as soon as the requirements are fulfilled, and I believe it will be a wise economy to push forward that great work to the fullest extent.

Colonel Buffington and Captain Crozier, the inventors of the disappearing gun carriage adopted by the Ordnance Department, have generously donated their invention to the Government, and they should receive especial commendation for their patriotism, generosity, and zeal.

The work at the several arsenals and armories summarized by the Chief of Ordnance is of great importance, and the Department, while insisting upon efficient and economical management, is using every exertion to keep the work up to the highest standard, with a view to an increase of the output of all necessary material.

SALES OF STORES TO MILITIA.

The act of February 24, 1897, authorizing the issue of Springfield breech-loading rifles, caliber forty-five one-hundredths of an inch, to

each State and Territory for the National Guard thereof in exchange for other rifles now held, provided also, "That any State or Territory may, in addition to the stores and supplies issued under the provisions of this act and the act of February, 1887, purchase for the use of its National Guard or Reserve Militia, at regulation prices, for cash, at place of sale, such stores and supplies from any department of the Army as, in the opinion of the Secretary of War, can be spared."

In accordance with the provisions of existing law, the proceeds of such sales must be covered into the Treasury as "Miscellaneous Receipts," and accordingly the appropriations for this Department will be diminished by the amount of the sales authorized by the law quoted. The recommendation made by me on the 25th of June last to the chairman of the Committee on Appropriations of the Senate is therefore renewed, as follows:

That hereafter the cost of stores or supplies sold to any State or Territory under section 3 of the act approved February 24, 1897, shall be credited to the appropriations from which they were procured and remain available to procure like stores and supplies for the Army in lieu of those sold as aforesaid.

SIGNAL SERVICE.

WAR DEPARTMENT, SIGNAL OFFICE,
Washington, October 14, 1897.

SIR: In accordance with instructions of October 13, 1897, I have the honor to submit the following summary of my annual report for the fiscal year ending June 30, 1897:

The military telegraph lines, 802 miles in length, have been maintained in a most efficient manner, and business has been handled to the extent of about $13,000. All line receipts and disbursements have been accounted for without loss. Extension of lines in Arizona afford ample facilities for controlling movements of troops against marauding Indians from Mexico and fugitives from San Carlos.

The importance of connecting Fort Warren with Boston, and Fort Washington with Washington, is pointed out.

Instruction in military signaling under Army Regulations results most unsatisfactorily, as has been the case for the past twelve years. Many regiments have no officer or man proficient, and the deficiencies in the Army as a whole amount to 59 per cent for officers and 52 per cent for enlisted men. With the approval of the commanding general and the Secretary of War, the experiment of detailing signal detachments has been tried with marked success in the Department of the Colorado, where about 50 officers and 250 men are relieved by this system from signal practice and the time made available for more legitimate duties. Recalling that the old system failed in every campaign for the past twelve years—viz, the Geronimo, in 1886; Wounded Knee, 1890; Mexican border, 1893, and Chicago strike, 1894—the Chief Signal Officer recommends the extension of the system of details to all departments,

both on the grounds of efficiency and also of economy. Such an arrangement would relieve 360 officers and 1,140 enlisted men of the line from signal drill.

Experimental work with the military balloons is continued, and an estimate of $10,000, all an increase, is recommended on account of the great value of military balloons.

Flying telegraph trains have been improved and advance made in field telegraph work, electrically and telephonically, some being of the highest value.

The cable system of San Francisco Harbor has been entirely destroyed by time and accident. The renewal of this system and the construction of like lines in the harbors of New York and Boston is urgently recommended, and a special estimate of $20,000, all an increase, is submitted. The commercial importance of these cities and the indispensability of electrical communication in properly commanding their extensive fortifications are obvious reasons for favorable action on this estimate.

Hearty cooperation has been extended to the signal corps of the various National Guards, and to make it in the future more beneficial, without expense to the United States, it is recommended that the militia law be amended so as to permit the purchase from the United States of signal equipments and stores. Similar cooperation has been extended to the military colleges.

The War Department library has been greatly improved by the addition of scientific and professional publications, largely obtained through exchange. The literature relating to American wars is unusually full, and its value enlarged by the printing of two finding lists. Nearly 9,000 books have been loaned, of which 550 were to officers serving at distant posts, without loss or material injury.

The very valuable collection of 8,000 photographs relating to the war for the Union have been arranged, catalogued, and filed.

Nearly 40,000 public documents have been received and distributed. The issue of these documents is almost entirely confined to the War Department and to the Army. The few surplus copies, if any, are sent to the adjutant-generals of States and to military colleges. It is recommended that the militia law be amended so that the National Guard can purchase military publications of the War Department, a privilege which would add greatly to the theoretical training of the guard.

Very respectfully,

A. W. GREELY,
Brigadier-General, Chief Signal Officer, U. S. A.

The SECRETARY OF WAR.

In addition to his duties connected with the Signal Service, the Chief Signal Officer has supervisory charge of the War Department library and the distribution of documents.

The military telegraph lines have enabled the Army to keep in touch with the necessities of the service in the movement of troops against marauding Indians.

The experiment of detailing signal detachments for duty with troops in the field, having proved successful, will be extended as needed.

The Chief Signal Officer, in continuance of experimental work with military balloons, asks an appropriation of $10,000 for the purpose. This is an object which needs investigation, and as the amount asked for is not large, I commend it, as also the estimate of $20,000 for cable systems for the harbors of New York, Boston, and San Francisco.

RECORD AND PENSION OFFICE.

RECORD AND PENSION OFFICE,
WAR DEPARTMENT,
October 14, 1897.

SIR: In compliance with your instructions of yesterday, I have the honor to submit the following summary of my annual report, dated the 1st instant:

One hundred and forty-nine thousand eight hundred and seven cases were received during the last fiscal year, all of which were promptly disposed of, more than 96 per cent having been acted upon within twenty-four hours of the time of their receipt.

Since the date of the last annual report a new law (act approved February 24, 1897) has been enacted for the relief of persons who rendered service as commissioned officers of volunteers during the late war, for which they were not recognized or paid during or for the period for which the service was rendered. This law takes the place of the old "remuster" laws, which had expired by statutory limitation, and while the same in its practical effects, it is less ambignous and more satisfactory in its phraseology than the preceding legislation. Nearly 5,000 applications for remuster have been adjudicated under this law since its enactment.

Four thousand one hundred and sixty-five applications for removal of the charge of desertion under the act of March 2, 1889, were received and adjudicated during the fiscal year, and 5,981 cases incidentally encountered were considered under the law without the formality of an application therefor, making a total of 10,146 cases considered under the act referred to.

About 2,000 applications for certificates of discharge in the true names of soldiers who assumed other names at the time of their enlistment have been considered under the act of April 14, 1890, being an average of about 300 applications per year since the enactment of the law.

Under the act of Congress approved March 3, 1873, authorizing the Secretary of War to furnish duplicate certificates of discharge to ex-soldiers of the war of the rebellion who have lost their original discharges, 5,157 discharge certificates were issued during the fiscal year.

The work of reproducing the records of the personnel of the volunteer armies by the index-record card system, which was adopted for the records of the war of the rebellion and extended by Congressional authority to the records of the Revolutionary war and the war of 1812, has been continued with satisfactory results. With the exception of some few organizations in service during the Indian wars, all of the organization rolls of the wars in which the country has been engaged have been carded and the mutilated original records placed beyond the danger of destruction.

As the work of compiling the records of the Revolutionary war has progressed, it has become apparent that the collection of such records in this office is far from complete. It is hoped, however, that this collection will be augmented by the loan of records by the States and historical societies having such records in their possession. It is believed that the publication of the records of the Revolutionary war and the war of 1812, as contemplated by the act of Congress approved August 16, 1894, directing the transfer of those records to this Department, should be deferred until the compilation shall have been finished.

But few applications have been received from the governors of States for transcripts of the records of troops from their respective States under the act of Congress approved March 2, 1895, providing for the furnishing of such transcripts at the expense of the States, and it is evident that the State legislatures are unwilling to appropriate the money necessary to obtain such transcripts.

The avowed object of many of the States in compiling their records was to publish them, and it is not believed that the War Department should contribute to this object further than is necessary to fulfill the requirements of the law. The time has not yet come when the records of the personnel of the war of the rebellion can be published without endangering public and private interests. When that day arrives the Government should, and undoubtedly will, publish them, and in a far more complete and satisfactory manner than that in which it is possible for any State or private association to publish them. But no complete or accurate history of the records of personal military service during the late war can be published by anyone until the War Department shall have finished the compilation of all of the records in its custody, and these records include many of which copies are not in the possession of the State authorities.

It has frequently been urged upon the Department that persons employed by the States shall be given access to the records and permitted to extract therefrom such information as may be desired, and the extension of this privilege to historians and others, including claimants and attorneys, has been persistently demanded. To all such applications, those of State officials as well as those of no official station, the Department has been compelled to apply the well-established rule that access to the records must be denied to all persons not officially connected with the Department and subject to its control.

The official records are of a confidential nature, and are relied upon for the protection of public and private interests. To prevent the improper use of the information afforded by them requires the exercise of constant vigilance, and to permit promiscuous access to the records or to relax the rules established for the furnishing of information from them would deprive the Government of the protection afforded by the records in the detection of fraudulent claims, and would endanger the reputations of the living and the dead.

The adoption of the index-card system for the reproduction of the records of personal military service has resulted in a great saving of labor in the transaction of the business of the office. By the adoption of this system and other improved methods of business it has been found possible to materially reduce the clerical force, a reduction of 375 clerks having been made since the organization of the

Record and Pension Office, representing a permanent annual saving of $425,000 in salaries alone.

In all of the reductions that have been made in the clerical force the selections for discharge were based wholly upon the efficiency records of the clerks, a liberal allowance being made in the ratings on account of honorable military or naval service.

Very respectfully, F. C. AINSWORTH,

Colonel, United States Army, Chief Record and Pension Office.

The SECRETARY OF WAR.

The work of carding the rolls of the Revolutionary war and the war of 1812 has devolved much additional labor upon the Record and Pension Office, as has also the compilation of the records of the Revolutionary war, under the provisions of the act of August 16, 1894. It is gratifying to be able to state that notwithstanding this labor the current work of the office has been fully kept up, thus attesting the excellence of the system observed in that office.

WAR RECORDS OFFICE.

WAR DEPARTMENT, WAR RECORDS OFFICE,

Washington, October 13, 1897.

SIR: In compliance with your request of this date, I have the honor to submit the following summary of the annual report of the Board of Publication, Official Records of the War of the Rebellion:

The publication of the Official Records was carried forward and five volumes were published, and five supplemental volumes were printed and put in the hands of the indexers. When these shall have been distributed, as they will be before the close of the present fiscal year, the entire series of the records of the two armies that relate directly to battles and campaigns will have been completed, 113 volumes in all, of nearly 120,000 octavo pages. The Atlas contains 178 plates, embracing nearly 1,000 battle and campaign maps, sketches, and reproductions of photographic and other views.

The records remaining unpublished relate to prisoners and to organization, maintenance, etc., of the two armies, requiring in all 20 more books. By the close of the current fiscal year, the work of compilation of these records will probably be completed and at the present rate of publication four years will be required to finish the whole work, the expenditures upon which now reach very nearly $2,500,000.

About 60,000 volumes of the published records are stored in the Department; these consist of broken sets of the work that were allotted to beneficiaries, but remain in the Department unclaimed. A general distribution of these books can only be made by authority of Congress.

The number of employees now borne on the rolls is 60, and their annual salaries amount to about $77,000, leaving available for printing and binding, etc., of the current fiscal appropriation, about $53,000.

The current fiscal year's appropriations are:

Legislative bill	$15,380
Sundry civil bill	115,000
Total	130,380

The estimates submitted for the next fiscal year are the same as the above.

Respectfully,

GEO. W. DAVIS,
Major, U. S. A., President of the Board of Publication.

The SECRETARY OF WAR.

The report of the War Records Office affords the gratifying intelligence that with the close of the present fiscal year the entire series of records relating directly to battles and campaigns will have been printed and distributed. It is recommended that authority be granted to distribute the incomplete sets of the work, of which there are about 60,000 volumes now stored in the Department, occupying space much needed for other purposes.

THE BATTLEFIELD COMMISSIONS.

WAR DEPARTMENT,
GETTYSBURG NATIONAL MILITARY PARK,
Gettysburg, Pa., October 14, 1897.

GENERAL: In compliance with your request communicated to us on the 13th instant, the Commissioners of the Gettysburg National Park forward a brief summary of their forthcoming annual report so far as the same relates to the work projected, the expenses to be met, and the amount of moneys required for the next fiscal year:

First. A proceeding for the condemnation of land for right of way for a Telford avenue 2 miles along the Confederate line on Seminary Ridge is now pending in the circuit court of the United States for the eastern district of Pennsylvania, and will doubtless be concluded at the next spring term of that court. As soon as it is concluded, that section of the Confederate avenue should be promptly constructed so as to connect the two parts already finished at the northern and southern extremities of the Seminary Ridge, and thus make a complete avenue along the whole line of Longstreet's and Hill's corps, extending from the Chambersburg pike northwest of the town, southward and eastward to the foot of Round Top, a distance of more than 5 miles. One or more bridges must be built over the streams which cross that part at Seminary Ridge.

Second, The proceeding for condemning a part of the Gettysburg Electric Railroad line and removing it from the military positions which it effaces on the battlefield has been pending for some time in said court, and will probably be concluded ere long, and the amount that may be adjudged said railroad company will be then payable. The amount awarded by the jury of view, which was appealed from by both parties, was $30,000.

We trust the court's final judgment may reduce this.

Third. There is need for important improvements upon the avennes of the cavalry field 3 miles east of this town and for more suitable and substantial fencing of these avenues and of the entire grounds there.

Moreover, in order to show the Confederate positions, gun carriages should be provided, guns mounted to mark points occupied by Confederate batteries, and tablets erected to indicate the lines and evolutions of their cavalry.

Fourth. To mark the positions of the Confederate batteries along Seminary Ridge a great number of gun carriages must be provided and the guns mounted thereon.

Fifth. There is urgent need that the public roads which were ceded to the United States by the legislature of Pennsylvania within the bounds of the National Park should be "improved and maintained," in accordance with the terms and spirit of the act of Congress authorizing this to be done by the Secretary of War in his discretion.

Sixth. There are a number of avenues which need to be converted into Telford roads in order to make them at all suitable and convenient to those who would travel over the battlefield, since these are now but rough and narrow unsightly ways, in some places scarcely passable. Among these we may mention Wright avenue, leading from the gap between the Round Tops southeasterly across the Taneytown road along the line of Wright's division of the Sixth Corps; Pleasanton avenue, leading from Hancock avenue eastward by the cavalry headquarters to the Taneytown road, and the return avenue on Culps Hill, leading from Spangler Spring westward along the southern base of that hill, where the Union forces formed battle lines on the morning of July 3 and advanced to the strenuous and finally successful fight to recover their positions seized the evening before by the Confederates.

Seventh. The Reynolds, Buford, and Howard avenues, on the First Day's Field, are dirt roads located by the Memorial Association, are often in bad condition, and should be improved and made solid on either the macadam or Telford plan. A substantial bridge upon Reynolds avenue, across the railroad cut made historic by the remarkable conflict there, must be built soon, the old one having become dangerous.

Eighth. There is urgent need for a new avenue leading from the southeastern side of Culps Hill across Rock Creek to the extreme right flank of the Union and left flank of the Confederate infantry forces, respectively, and looking to its ultimate extension to the Cavalry Field, whither a good and commodious road is much needed. We will not refer to the many minor expenses, aggregating altogether a considerable amount, which are necessarily incident to the prosecution of a great work like the establishment of this National Military Park.

Feeling sure that it would be wise to appropriate $150,000 for this work for the next fiscal year, we respectfully recommend that amount.

JOHN P. NICHOLSON,
WM. M. ROBBINS,
CHAS. A. RICHARDSON,
Commissioners.

The SECRETARY OF WAR.

WAR DEPARTMENT,
CHICKAMAUGA AND CHATTANOOGA NATIONAL PARK COMMISSION,
Washington, October 14, 1897.

SIR: In reply to your request of October 13, instant, asking for a summary of the annual report of this Commission, I have the honor to say that the work of establishing the Chickamauga and Chattanooga National Park has rapidly progressed under your direction during the past season, and strictly in accordance with existing laws, and with the plan heretofore adopted. No change in this plan seems to the Park Commission to be required or advisable, no new legislation is suggested, and no increase of appropriation over that made for the current fiscal year is needed.

Since the last annual report the battlefield of Lookout Mountain has been added to the park at a cost of $22,065, which was paid for out of the annual appropriation. It is hoped that 10 or 12 acres on the top of the mountain at its north point may be acquired in the same way during the coming year, and this will complete the purchase of land for the Chattanooga section of the park, with the possible exception of some very small tracts on Missionary Ridge.

Interest in the park is rapidly increasing throughout the country. Most of the twenty-six State commissions cooperating with the National Commission have been active in providing for the erection of monuments, and have measures prepared, where such have not already been passed, for presentation at the coming sessions of their legislature for erecting monuments upon the field. Those States which have completed their work on the Chickamauga section are nearly all engaged in preparing for or executing similar work in the Chattanooga section of the park. Quite a number of the States which have erected regimental and battery monuments throughout the park are now engaged in putting up costly State monuments of imposing design.

The visits of veteran organizations to the field from all sections of the country have been very numerous, as have those of State authorities, press organizations, and societies of various kinds. The trunk lines of railroad centering at Chattanooga are also giving much attention to bringing visitors to the park.

The State authorities of Tennessee and Georgia and the county and municipal authorities of Tennessee have been prompt and liberal in affording every legal facility for prosecuting the work of the park.

The care given to ascertain lines of battle and the success attending the same appears from the fact that every brigade line on each side has been established upon seven distinct fields, namely, Chickamauga, Wauhatchie, Lookout Mountain, Orchard Knob, Missionary Ridge, Tunnel Hill, and Ringgold, and no difference has arisen in regard to any of these, with a single exception, and that in the case of a line specifically and definitely located by General Grant upon his official map of the battle of Chattanooga. In the location of the great multitude of regimental and battery positions only a single case of difference with the decisions of the National Commission is pending, and no difficulty is anticipated in the settlement of the same.

During the past summer the Lookout Mountain field has been cleared of underbrush, paths constructed to reach every difficult point of its rugged topography, and complete historical tablets for every brigade and division and the artillery engaged prepared and cast.

The eight artesian wells on the Chickamauga field have been tested by the unprecedented drought of the season and found to furnish abundant water for all purposes of camping and maneuvering troops.

The use of the park as a refuge from Southern coast and Gulf garrisons in periods of yellow-fever visitation has been demonstrated by the presence of the garrison from New Orleans upon the park.

The death of General Fullerton was a severe loss to the public service, and the appointment of Col. Henry M. Duffield as the historian of the Commission has proved to be one that will effectually advance the work of the park, not only in its historical features, but in every department of study and labor connected with its establishment.

The engineer's report shows a great amount of work connected with roads, the clearing of the entire area of the park of a growth of underbrush, the care of roads, the placing of foundations for State monuments, the construction of additional roads, the increase of the water supply, the improvement of Orchard Knob, the opening and establishment of the Lookout Mountain section of the park, the construction of three bridges, and a great variety of lesser work of similar character. This has all been performed in the most efficient and satisfactory manner by the force engaged upon the park, and it is believed that the money appropriated has been most economically applied under the numerous heads of expenditure, and that all of the work has been of excellent and lasting character.

The appropriation for the present year was $75,000, being the same sum appropriated for the preceding year, and the same asked for the next. The expenditures have been within the sums set aside for each branch of the work, and the balance now on hand of $57,800 will carry the work in progress to the end of the present fiscal year.

The Commission feels under great obligation to you for the official assistance which you have so promptly rendered whenever any question connected with the park work has been submitted for your decision.

Very respectfully, your obedient servant,

H. V. BOYNTON,
Chairman of Commission.

The SECRETARY OF WAR.

WAR DEPARTMNET,
ANTIETAM BATTLEFIELD BOARD,
Washington, D. C., October 15, 1897.

SIR: In compliance with your instructions of the 13th instant, requesting a summary of the operations of the Antietam Battlefield Board, I have the honor to submit the following:

The work on the Antietam battlefield, that was commenced under authority of the act of Congress approved August 30, 1890, is practically finished, and available appropriation will suffice for its completion.

The marking of the battle lines of the two armies consisted in—

1. Careful studies of the field and of the movements of troops thereon during the several stages of the action fought on September 17, 1862.

2. The erection of iron tablets bearing brief historical descriptions of the movements of troops.

3. The acquirement of strips of land upon which these tablets could be erected and that would afford roadways for all the important points of interest.

4. The erection of simple monuments marking the places where general officers were killed.

5. The erection of a masonry tower giving an elevated platform that affords a commanding view of the whole field.

6. The establishment at prominent points on the field of a few pieces of field artillery of the type used in the battle.

7. The careful survey of the field and the preparation of accurate maps showing the position of troops in the different stages of the action.

The survivors of a few military organizations that fought at Antietam have purchased land and have erected on suitable sites permanent monuments marking positions and bearing inscriptions recording the services of the organizations. Twelve such monuments have been erected, and others are contemplated. In a few instances deeds of the land whereon these structures stand have been tendered as gifts to the United States, and have been accepted by the Secretary of War under authority of the act of August 30, 1890.

Under authority of the act of June 11, 1896, historical tablets have been erected at South Mountain, Cramptons Gap, Shepherdstown, and Harpers Ferry.

The completion of the map, expected by December 31, 1897, will close the work committed to the board.

Appropriations for this work have been made as follows to date:

Act of—		
August 30, 1890	$15,000.00	
August 5, 1892	16,310.00	
March 5, 1893	15,000.00	
March 2, 1895	9,421.00	
June 8, 1896 (deficiency)	300.00	
June 11, 1896	17,000.00	
July 19, 1897 (deficiency)	5,000.00	
Total appropriations		$78,031.00
Expended to date:		
Salaries of civilian members of the board	26,223.33	
Surveys and maps	5,916.24	
Land	3,323.88	
Roads and fencing	24,330.76	
Observation tower	3,327.11	
Tablets, markers, etc	7,865.98	
Miscellaneous	3,094.39	
Total expenditures		74,081.69
Balance		3,949.31

Very respectfully,

GEO. W. DAVIS,

Major, U. S. A., President Antietam Battlefield Board.

The SECRETARY OF WAR.

WAR DEPARTMENT,
SHILOH BATTLEFIELD COMMISSION,
Pittsburg Landing, Tenn., October 22, 1897.

SIR: In accordance with the circular letter from the chief clerk of the War Department, dated October 13, the following summary of the annual report of the Shiloh Battlefield Commission is herewith submitted:

Since the last report the topographical survey of the field and the study of the reports, for the purpose of locating camps, battle lines, and original roads, has progressed with fair success. The camp of almost every Union command on the morning of April 6, 1862, has been identified.

Much difficulty has been experienced in obtaining sufficient titles to the land negotiated for, but this is gradually being overcome. The area of land required to properly explain the battle of Shiloh is 3,650 acres, and of this 1,063.33 acres have been paid for at a cost of $15,848.80.

Agreements for the purchase of about two-thirds of the area have been made, and the titles are being perfected. It is expected that there will be but little trouble in securing the rest of the land during the coming winter.

The sundry civil bill of 1897 made the limit of the cost of land "not to exceed fifty thousand dollars." The expenditure for land, as shown below, of $15,848.80 leaves $34,151.20 available for this purpose, and it is believed that the remainder of the area required can be secured within this limit.

During the year 250 condemned cannon and 11,000 shell (for marking positions) of the type used in the battle of Shiloh have been delivered by the Ordnance Department at the park.

An estimate for $55,000 for the year commencing July 1, 1898, has been submitted. This is a decrease of $5,000 from the amount of the present year's appropriation.

The appropriations and expenditures from the organization of the Commission to September 30, 1897, are as follows:

First appropriation, approved December 27, 1894		$75,000.00
Second appropriation, approved June 4, 1897		60,000.00
Total		135,000.00
Items of expenditures:		
Salaries	$30,733.33	
Traveling expenses	1,746.63	
Office expenses	5,119.30	
Land and conveyancing	15,848.80	
Topography and maps	19,141.32	
Buildings and quarters	594.13	
Roads and bridges	18.90	
Monuments and markers	40.91	
Cannon and gun carriages	323.76	
		73,567.08
Balance		61,432.92

Very respectfully, your obedient servant,

CORNELIUS CADLE, *Chairman.*

The SECRETARY OF WAR.

These battlefields marked and to be marked, as they have been and will be, are an object lesson of patriotism, wherein heroic deeds are enshrined for the contemplation of the youth of the country. The monuments bear a brief historical legend, compiled without praise and without censure. Like an official seal, they import absolute verity.

The work is progressing. At Antietam it is almost finished, and no further appropriation is needed. At Gettysburg and Chickamauga the magnitude of the work is commensurate with the importance of the battles commemorated. At Shiloh the work is not yet beyond the commencement stage.

STATUES.

When the statues of Generals Sherman, Sheridan, and Logan, for which Congress has made provision, shall have been completed, it will give to the city of Washington statues of seven or more distinguished generals of the late war, besides those of Admirals Dupont and Farragut, distinguished officers of the Navy. As yet no provision has been made for the erection of a statue to General Grant, and I renew the recommendation of my predecessor, that Congress make provision for the erection of a suitable statue or memorial to that illustrious officer.

The recommendation of Colonel Bingham, that an annual appropriation of $150 be made for the purpose of cleaning and preserving the public monuments in this city is commended to favorable consideration.

EXPENDITURES, APPROPRIATIONS, AND ESTIMATES.

The expenditures for the fiscal year ending June 30, 1897, the appropriations for the present year, and the estimates of amounts required for the year beginning July 1, 1898, are shown in the following statement:

General object.	Expenditures for fiscal year ended June 30, 1897.	Appropriations for fiscal year ending June 30, 1898.	Estimates for fiscal year ending June 30, 1899.
Salaries and contingent expenses	$1,623,509.54	$1,455,956.00	$1,462,216.00
Pay, etc., of the Army	12,938,571.80	13,128,954.30	13,987.067.29
Subsistence of the Army	1,406,430.12	1,650,000.00	1,655,183.75
Regular supplies, Quartermaster's Department	1,728,339.25	2,000.000.00	2,000,000.00
Incidental expenses, Quartermaster's Department	550,124.09	600.000.00	600,000.00
Barracks and quarters and hospital construction	789,153.04	832,000.00	860,000.00
Shooting ranges and contingencies of the Army	15,885.27	25,000.00	25.000.00
Cavalry and artillery horses	153,688.65	130,000.00	130,000.00
Army transportation	2,199,938.58	2,400,000.00	2,500,000.00

General object.	Expenditures for fiscal year ended June 30, 1897.	Appropriations for fiscal year ending June 30, 1898.	Estimates for fiscal year ending June 30, 1899.
Clothing, etc	$1,034,521.39	$1,050,000.00	$1,050,000.00
Medical Department	132,642.76	150,200.00	140,200.00
Ordnance Department	1,046,873.94	1,119,000.00	1,156,000.00
Military Academy	572,858.24	479,572.83	640,310.45
Fortifications and seacoast defenses	6,345,158.13	9,517,141.00	13,378,571.00
Arsenals, etc	267,404.20	138,610.00	564,480.00
Rivers and harbors	13,683,103.81	23,278,028.37	48,728,160.56
Parks, cemeteries, military posts, etc	787,620.50	889,367.75	2,558,639.75
National Soldiers' Homes	3,054,268.01	3,391,346.00	4,079,221.00
Artificial limbs	576,037.06	185,000.00	133,575.00
Buildings and grounds in and around Washington	156,941.04	110,751.00	191,831.00
Miscellaneous items	287,067.30	301,490.00	417,990.00
Totals	49,350,136.72	62,832,417.25	96,258,445.80

Expenditures from permanent annual appropriations and appropriations for war claims are not included in the above statement, but are shown in the appendix to this report.

R. A. ALGER,
Secretary of War.

APPENDIX.

1897.

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1897, showing the amount appropriated under each title of appropriation, the amount drawn by requisition upon the Treasury, and the balances subject to requisition July 1, 1897.

Title of appropriation.	Balance July 1, 1896.	Appropriated July 1, 1896, to June 30, 1897.	Repayments July 1, 1896, to June 30, 1897.	Aggregate available.	Payments July 1, 1896, to June 30, 1897.	Carried to surplus fund June 30, 1897.	Balance June 30, 1897.
SALARIES, CONTINGENCIES, AND CIVIL APPROPRIATIONS.							
Salaries, Office of—							
Secretary of War	$11,076.13	$94,300.00	.....	$105,376.13	$92,732.35	$7,376.13	$5,267.65
Adjutant-General	6,698.38	159,280.00	.....	165,978.38	158,623.25	5,268.38	2,086.75
Inspector-General	150.82	13,160.00	.....	13,310.82	13,160.00	150.82	.....
Judge-Advocate-General	672.20	13,660.00	.....	14,332.20	13,271.35	174.19	886.66
Quartermaster-General	3,818.59	152,340.00	.....	156,158.59	151,916.69	3,058.59	1,183.31
Commissary-General	289.15	42,760.00	.....	43,049.15	42,750.41	256.99	41.75
Surgeon-General	3,346.34	151,266.00	.....	154,612.34	150,148.93	2,705.34	1,758.07
Paymaster-General	856.43	34,560.00	.....	35,416.43	34,432.77	378.08	605.58
Chief of Ordnance	367.89	41,660.00	.....	42,027.89	41,616.37	367.84	43.68
Chief of Engineers	568.05	21,840.00	.....	22,408.05	21,709.33	533.21	165.51
Publication of Records of the Rebellion	1,328.72	15,380.00	.....	16,708.72	15,370.16	1,328.70	9.86
Record and Pension Office, War Department	45,064.41	616,430.00	.....	661,494.41	586,366.49	30,314.41	44,813.51
Signal Office	.....	5,700.00	.....	5,700.00	5,700.00	.....	.....
Of employees, public buildings and grounds	62.56	48,020.00	.....	48,082.56	48,013.37	62.56	6.63
Contingent expenses, public buildings and grounds	6.54	500.00	.....	506.54	500.57	.54	5.43
Contingent expenses, War Department	36,828.21	45,000.00	.....	81,828.21	42,373.85	13,168.44	26,285.92
Postage to Postal Union countries, War Department	.....	500.00	.....	500.00	500.00	.....	.....
Stationery, War Department	25,519.12	25,000.00	.....	50,519.12	15,666.98	7,032.24	27,819.90
Rent of buildings, War Department	900.00	4,600.00	.....	5,500.00	4,600.00	900.00	.....
Total salaries, contingencies, etc	137,553.54	1,485,956.00	.....	1,623,509.54	1,439,452.87	73,076.46	110,980.21
Erection of monuments, etc.							
Repairs to the Guilford battle grounds	.....	1,000.00	.....	1,000.00	1,000.00	.....	.....
Battle lines and sites for tablets at Antietam	.....	17,000.00	.....	17,000.00	16,999.79	.....	.21
Lincoln tablet, Gettysburg National Park	4,900.00	.....	$34.60	4,934.60	.....	.....	4,934.60
Pedestal for statue of Gen. Philip H. Sheridan	50,000.00	.....	.....	50,000.00	.....	.....	50,000.00
Pedestal for statue of Gen. John A. Logan	47,999.21	.....	.....	47,999.21	.....	.....	47,999.21
Pedestal for statue of Samuel D. Gross	.....	.....	32.41	32.41	.....	.....	32.41
Pedestal for and statue of Gen. William T. Sherman	80,000.00	.....	.....	80,000.00	.....	.....	80,000.00
Total erection of monuments	182,899.21	18,000.00	67.01	200,966.22	17,999.79	.....	182,966.43
Repayments in excess of payments	.....	.....	.....	.....	67.01	.....	.....
Actual expenditures	.....	.....	.....	.....	17,932.78	.....	.....

Buildings and grounds in and around Washington.							
Improvement and care of public grounds	1,189.77	52,800.00		53,989.77	52,129.81	689.77	1,170.19
Repairs, fuel, etc., Executive Mansion	10,438.86	33,875.00		44,313.86	32,148.23	5,938.86	6,226.77
Lighting, etc., Executive Mansion	509.61	17,781.40		18,291.01	14,669.27	466.43	3,155.31
Repairs to water pipes and fire plugs	39.95	2,500.00	31.98	2,571.93		39.95	2,531.98
Telegraph to connect the Capitol with the Departments, etc	.70	3,100.00		3,100.70	3,099.57	.70	.43
Purchase and repair of building where Abraham Lincoln died		31,000.00		31,000.00	30,173.00		827.00
Care and maintenance of Washington Monument	155.08	11,520.00		11,675.08	11,484.47	155.08	35.53
Steam tug, harbor of New York	4,885.58		912.50	5,798.08		4,885.58	912.50
Prevention of deposits, harbor of New York	4,093.06	59,000.00		63,093.06	58,905.63	39.80	4,147.63
Transportation of reports and maps to foreign countries	100.00	100.00		200.00	92.90	100.00	7.10
Support and medical treatment of destitute patients	1,583.41	19,000.00		20,583.41	18,999.96	.04	1,583.41
Maintenance of Garfield Hospital		19,000.00		19,000.00	19,000.00		
National encampment Grand Army of the Republic	1,786.88			1,786.88		1,786.88	
Branch printing office, War Department		5,649.25		5,649.25	5,490.15		159.10
Erection of fishways at Great Falls	8.99			8.99		8.99	
Increasing the water supply of Washington, D. C	301,545.78			301,545.78	7,663.08		293,882.70
Improving the receiving reservoir, District of Columbia			1,472.06	1,472.06		39.55	1,432.51
Repairs to Aqueduct Bridge, District of Columbia	69,690.30			69,690.30	1,500.00	4,690.30	63,500.00
Ford's Theater building: Repairs	9.39			9.39		9.39	
Investigations pertaining to water rights and titles to land at Great Falls	4,000.00			4,000.00		4,000.00	
Estimate for bridge across Eastern Branch of Potomac River at Massachusetts avenue, District of Columbia		3,000.00		3,000.00	1,000.00		2,000.00
Total buildings and grounds in and around Washington	400,037.36	258,325.65	2,416.54	660,779.55	256,356.07	22,851.32	381,572.16
Repayments in excess of payments					2,416.54		
Actual expenditures					253,939.53		
MILITARY ESTABLISHMENT.							
Expenses of Commanding General's Office		1,750.00		1,750.00	1,612.71		137.29
Expenses of recruiting	42,140.55			42,140.55	77.29	42,063.26	
Contingencies Military Information Division, Adjutant-General's Office	98.94	3,640.00		3,738.94	3,260.02	84.24	394.68
Contingencies headquarters of military departments	898.04	3,000.00		3,898.04	2,536.14	603.04	758.86
Contingencies of the Army	23,595.94	15,000.00		38,595.94	6,721.66	11,329.04	20,545.24
Signal Service of the Army	4,591.36	18,000.00		22,591.36	22,043.16	28.13	520.07
Mileage to officers traveling without troops	28,922.97	140,000.00		168,922.97	119,173.14	1,265.17	48,484.66
Pay, etc., of the Army	27,399.27	12,963,512.73		12,990,912.00	12,819,398.66	7,781.87	163,731.47
Subsistence of the Army	176,198.54	1,650,000.00		1,826,198.54	1,406,430.12	21,224.64	398,543.78
Regular supplies, Quartermaster's Department	838,600.52	2,200,000.00		3,038,600.52	1,728,339.25	377,787.56	932,473.71
Incidental expenses, Quartermaster's Department	78,746.37	600,000.00		678,746.37	550,124.09	29,159.17	99,463.11
Barracks and quarters	73,515.06	850,000.00		923,515.06	707,204.61	10,011.20	206,299.25
Transportation of the Army and its supplies	720,867.85	2,400,000.00		3,120,867.85	2,199,938.58	100,240.01	820,689.26
Transportation of the Army and its supplies, Pacific railroads		116,708.00		116,708.00	116,708.00		
Horses for cavalry and artillery	54,066.19	130,000.00		184,066.19	153,688.65	29,818.94	558.60
Construction and repair of hospitals	428.00	75,000.00		75,428.00	74,941.57	69.00	417.43
Quarters for hospital stewards	132.02	7,000.00		7,132.02	7,006.86	116.98	8.18
Shooting galleries and ranges	1,385.85	10,000.00		11,385.85	9,163.61	1,428.14	794.10

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1897, etc.—Continued.

Title of appropriation.	Balance July 1, 1896.	Appropriated July 1, 1896, to June 30, 1897.	Repayments July 1, 1896, to June 30, 1897.	Aggregate available.	Payments July 1, 1896, to June 30, 1897.	Carried to surplus fund June 30, 1897.	Balance June 30, 1897.
MILITARY ESTABLISHMENT—continued.							
Purchase of land for target ranges, Fort McPherson, Ga			$3.20	$3.20			$3.20
Bellevue rifle range, Omaha, Nebr		$600.00		600.00	$600.00		
Land for rifle range near Madison Barracks, N. Y	$13.00			13.00			13.00
Clothing and camp and garrison equipage	303,665.30	1,050,000.00		1,353,665.30	1,034,521.39	$21,730.84	297,413.07
Hospital, Fort Meade, S. Dak	367.09		56.56	423.65			423.65
Army and Navy Hospital, Hot Springs, Ark	18.07			18.07			18.07
Medical and Hospital Department	115,793.88	140,500.00		256,293.88	117,681.34	56,852.94	81,759.60
Army Medical Museum		5,000.00		5,000.00	4,961.42	38.58	
Library, Surgeon-General's Office	11.10	10,000.00		10,011.10	10,000.00		11.10
Engineer depot at Willets Point, N. Y	3,033.01	9,500.00		12,533.01	9,471.36	101.80	2,959.85
Bridge trains and equipage			2.00	2.00		2.00	
Ordnance stores, etc	881.80	563,000.00		563,881.80	563,327.70	158.24	395.86
Ordnance service	791.99	100,000.00		100,791.99	100,319.02	391.61	81.36
Ordnance material, proceeds of sales	154,039.57	17,964.83		172,004.40	41,840.73		130,163.67
Manufacture of arms	30,095.20	400,000.00		430,095.20	332,412.49		97,682.71
Pay of Military Academy	22,145.74	303,482.61		325,628.35	301,189.40	7,349.27	17,089.68
Current and ordinary expenses, Military Academy	2,106.67	68,379.00		70,485.67	59,974.80	2,126.16	8,384.71
Miscellaneous items and incidental expenses, Military Academy	850.22	15,894.00		16,744.22	15,000.00	850.22	894.00
Total Military Establishment	2,706,000.11	23,867,331.17	61.76	26,573,393.04	22,519,667.77	722,612.05	3,331,113.22
Repayments in excess of payments					61.76		
Actual expenditures					22,519,606.01		
PUBLIC WORKS.							
Buildings and grounds, Military Academy.							
Buildings and grounds, Military Academy		111,770.00		111,770.00	60,000.00		51,770.00
New gymnasium, Military Academy	11.37			11.37			11.37
Memorial Hall, West Point, N. Y	206,096.23			206,096.23	100,000.00		106,096.23
Total buildings and grounds, Military Academy	206,107.60	111,770.00		317,877.60	160,000.00		157,877.60
Arsenals.							
Rock Island bridge, Rock Island, Ill		12,250.00		12,250.00	12,250.00		
Reconstructing Rock Island bridge, Rock Island, Ill	21,000.00	10,200.00		31,200.00	31,200.00		
Rock Island Arsenal, Rock Island, Ill	17,500.00	51,325.50		68,825.50	40,675.50		28,150.00
Benicia Arsenal, Benicia, Cal	4,500.00	2,500.00		7,000.00	6,075.00		925.00
Columbia Arsenal, Columbia, Tenn	167.50	1,500.00		1,667.50	1,500.00	167.50	

Frankford Arsenal, Philadelphia, Pa		10,000.00		10,000.00	10,000.00		
Indianapolis Arsenal, Indianapolis, Ind	6,823.15			6,823.15	6,823.15		
Springfield Arsenal, Springfield, Mass	1,146.92	10,000.00		11,146.92	10,000.00		1,146.92
Watervliet Arsenal, West Troy, N. Y	9,975.00	59,120.00		69,095.00	13,625.00		55,470.00
Watertown Arsenal, Watertown, Mass	47,500.00	22,000.00		69,500.00	39,803.97		29,696.03
Repairs of arsenals	152.05	45,000.00		45,152.05	44,711.58	152.05	288.42
Powder depot, Dover, N. J	19,299.92			19,299.92			19,299.92
Proving ground, Sandy Hook, N. J	51,217.39	48,500.00		99,717.39	40,740.00		58,977.39
Testing machine		10,000.00		10,000.00	10,000.00		
Total arsenals, etc	179,281.93	282,395.50		461,677.43	267,404.20	319.55	193,953.68
Fortifications.							
Howell counterpoise carriage	50,000.00			50,000.00	26,955.00		23,045.00
Artesian well, Fortress Monroe, Va	5,900.00			5,900.00			5,900.00
Armament of fortifications	4,965,750.99	4,747,708.00		9,713,458.99	3,337,398.55		6,376,060.44
Preservation and repair of fortifications	58,023.28	100,000.00		158,023.28	56,880.36		101,142.92
Board of Ordnance and Fortification	414,281.46	150,000.00		564,281.46	92,305.31		471,976.15
Board on Fortifications or Other Defenses	28,470.77			28,470.77			28,470.77
Board on Pacific Coast Gun Factory	2,500.00			2,500.00			2,500.00
Construction of a counterpoise battery	37,400.00			37,400.00			37,400.00
Plans for fortifications	5,000.00	5,000.00		10,000.00	5,000.00		5,000.00
Torpedoes for harbor defense	159,306.65	150,000.00		309,306.65	106,557.31		202,749.34
Machine guns	700.00			700.00		700.00	
Ammunition for morning and evening gun	4.89	20,000.00		20,004.89	2,974.00	4.89	17,026.00
Torpedo howitzers	15,000.00			15,000.00			15,000.00
Artillery targets		6,000.00		6,000.00	6,000.00		
Target range, Jefferson Barracks, Mo		18,000.00		18,000.00			18,000.00
Pneumatic dynamite guns	233,317.80			233,317.80	3,000.00		230,317.80
10-inch pneumatic disappearing gun carriage	22,802.80			22,802.80	10,000.00		12,802.80
Gatling 8-inch gun	40,000.00			40,000.00			40,000.00
Emery loading apparatus	10,000.00			10,000.00			10,000.00
Sea walls and embankments	17,975.07	108,000.00		125,975.07	17,475.00		108,500.07
Sea wall, Governors Island, New York Harbor	297.94			297.94	297.94		
Sites for fortifications and seacoast defenses	566,843.14	300,000.00		866,843.14	180,360.50		686,482.64
Gun and mortar batteries	2,933,877.84	3,841,333.00		6,775,210.84	2,497,914.82		4,277,296.02
Purchase of sites for seacoast defenses	100.28			100.28	100.28		
Powder and projectiles, proceeds of sales	1,677.22		141.25	1,818.47			1,818.47
Total fortifications	9,569,230.13	9,446,041.00	141.25	19,015,412.38	6,343,219.07	704.89	12,671,488.42
Repayments in excess of payments					141.25		
Actual expenditures					6,343,077.82		
Military posts.							
Wharf at Fortress Monroe, Va	28,336.61			28,336.61			28,336.61
Sewerage system, Fortress Monroe, Va	21,860.00			21,860.00	11,054.31		10,805.69
Bridge over Mill Creek, Fortress Monroe, Va	115.78			115.78		115.78	
Military posts	28,851.65	300,000.00		328,851.65	198,981.05	54.93	129,815.67
Military post, Bismarck, N. Dak		40,000.00		40,000.00			40,000.00
Military post, Spokane, Wash		100,000.00		100,000.00	15,373.33		84,626.67

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1897, etc.—Continued.

Title of appropriation.	Balance July 1, 1896.	Appropriated July 1, 1896, to June 30, 1897.	Repayments July 1, 1896, to June 30, 1897.	Aggregate available.	Payments July 1, 1896, to June 30, 1897.	Carried to surplus fund June 30, 1897.	Balance June 30, 1897.
PUBLIC WORKS—continued.							
Military posts—Continued.							
Military post, Fort Riley, Kans		$75,000.00		$75,000.00	$28,131.00		$46,869.00
Military post, Fort Harrison, Mont		40,000.00		40,000.00	40,000.00		
Military post, Fort D. A. Russell, Wyo		40,000.00		40,000.00	40,000.00		
Fort Wayne Military Reservation		20,000.00		20,000.00	19,861.95		138.05
Purchase of buildings at military posts	$9,977.48			9,977.48			9,977.48
Additional lands, Fort Ethan Allen Military Reservation	7,000.00	3,000.00		10,000.00	10,000.00		
Military storehouse, Omaha, Nebr	11,019.13			11,019.13			11,019.13
Transfer of school site, Fort McClary Military Reservation, Me	150.35			150.35			150.35
Gettysburg National Park	12,913.47	50,000.00		62,913.47	62,690.75		222.72
Payment to Gettysburg Battlefield Memorial Association	2,000.00			2,000.00	1,960.46		39.54
Shiloh National Military Park	42,088.89			42,088.89	30,719.91		11,368.98
Improvement of Yellowstone National Park		40,000.00		40,000.00	40,000.00		
Chickamauga and Chattanooga National Park		150,000.00		150,000.00	79,122.63		70,877.37
Total military posts	164,313.36	858,000.00		1,022,313.36	577,895.39	$170.71	444,247.26
Harbors and rivers.							
Improving harbor at—							
Belfast, Me		8,000.00		8,000.00			8,000.00
Rockland, Me		375,500.00		375,500.00	1,000.00		374,500.00
Portland, Me		370,000.00		370,000.00	2,000.00		368,000.00
Camden, Me		10,000.00		10,000.00	9,686.95		313.05
Sullivan Falls, Me		5,000.00		5,000.00			5,000.00
Improving Carvers Harbor at Vinal Haven, Me		10,000.00		10,000.00			10,000.00
Breakwater from Mount Desert to Porcupine Island, Me		10,000.00		10,000.00	10,000.00		
Improving harbor at Portsmouth, N. H	4,432.39			4,432.39			4,432.39
Harbor of refuge at Little Harbor, N. H		10,000.00		10,000.00			10,000.00
Improving harbor at—							
Burlington, Vt	10,000.00	10,000.00		20,000.00	10,600.00		9,400.00
Swanton, Vt	326.93			326.93		326.93	
Improving Woods Holl Channel, Mass		20,000.00		20,000.00	500.00		19,500.00
Harbor of refuge at—							
Woods Holl, Mass	400.08			400.08			400.08
Sandy Bay, Cape Ann, Mass	100,000.00	150,000.00		250,000.00	75,000.00		175,000.00
Improving harbor at—							
Boston, Mass	160,500.00	470,000.00		630,500.00	100,000.49		530,499.51
Chatham, Mass	597.85	5,000.00		5,597.85			5,597.85
Hyannis, Mass	500.00	6,000.00		6,500.00	500.00		6,000.00

Gloucester, Mass	10,000.00	34,000.00		44,000.00	30,000.00		14,000.00
Lynn, Mass		20,000.00		20,000.00			20,000.00
Manchester, Mass	646.96			646.96	646.96		
Nantucket, Mass	3,400.00	20,000.00		23,400.00	3,000.00		20,400.00
Newburyport, Mass		16,000.00		16,000.00			16,000.00
New Bedford, Mass		10,000.00		10,000.00	10,000.00		
Plymouth, Mass	3,000.00	1,500.00		4,500.00	1,500.00		3,000.00
Provincetown, Mass	4,000.00	1,500.00		5,500.00			5,500.00
Scituate, Mass		6,000.00		6,000.00			6,000.00
Salem, Mass	631.34			631.34			631.34
Vineyard Haven, Mass	7,000.00	7,000.00		14,000.00	1,000.00		13,000.00
Wareham, Mass	238.70			238.70			238.70
Wellfleet, Mass	4,634.43			4,634.43			4,634.43
Marthas Vineyard, Mass	1,000.00			1,000.00	1,000.00		
Kingston, Mass	1,059.91			1,059.91			1,059.91
Improving Canapitsit Channel, Mass	2,000.00			2,000.00			2,000.00
Harbor of refuge at Point Judith, R. I	14,000.00	600,000.00		614,000.00	279,000.42		334,999.58
Improving Cove Coaster's Harbor Island, R. I	.50			.50		.50	
Improving harbor at Great Salt Pond, Block Island, R. I		40,000.00		40,000.00	30,000.00		10,000.00
Improving harbor at—							
Block Island, R. I	1,200.00	5,000.00		6,200.00	3,200.00		3,000.00
Newport, R. I	2,800.00	15,000.00		17,800.00	17,800.00		
Improving harbor at Wickford, R. I		6,300.00		6,300.00	6,300.00		
Improving entrance to Point Judith Pond, R. I	9,447.38			9,447.38			9,447.38
Breakwater at New Haven, Conn	2,500.00	100,000.00		102,500.00	98,500.47		3,999.53
Harbor of refuge, Duck Island Harbor, Conn		24,000.00		24,000.00	2,000.00		22,000.00
Improving harbor at—							
Bridgeport, Conn		28,000.00		28,000.00	7,000.00		21,000.00
Five Mile River, Conn		2,500.00		2,500.00			2,500.00
New Haven, Conn	500.00	10,000.00		10,500.00	1,500.00		9,000.00
Norwalk, Conn	13,500.00	10,000.00		23,500.00	23,500.00		
Stonington, Conn	500.00	5,000.00		5,500.00	4,000.00		1,500.00
Stamford, Conn		10,000.00		10,000.00	1,000.00		9,000.00
Wilsons Point, Conn	503.10			503.10			503.10
Cos Cob and Miamus River, Conn		8,000.00		8,000.00	1,000.00		7,000.00
Westport, Conn		3,000.00		3,000.00	3,000.00		
Greenwich, Conn		6,000.00		6,000.00	1,250.00		4,750.00
Improving—							
Arthur Kill, between Staten Island and New Jersey, N. Y. and N. J	1,092.77			1,092.77			1,092.77
Canarsie Bay, N. Y	1,500.00	10,000.00		11,500.00	11,500.00		
Flushing Bay, N. Y		4,000.00		4,000.00	4,000.00		
Channel in Gowanus Bay, N. Y	1,000.00	575,000.00		576,000.00	117,500.00		458,500.00
Channel between Staten Island and New Jersey, N. Y. and N. J		13,000.00		13,000.00	13,000.00		
Breakwater at Rouse's Point, Lake Champlain, N. Y	32.45			32.45		32.45	
Improving harbor at—							
Buffalo, N. Y	125,996.00	481,250.00		607,246.00	29,000.30		578,245.70
Charlotte, N. Y	1,750.00	12,000.00		13,750.00	4,950.00		8,800.00
Dunkirk, N. Y	1,998.41	408,258.00		410,256.41	11,247.91		399,008.50
Cape Vincent, N. Y		25,000.00		25,000.00	300.37		24,699.63
Great Sodus Bay, N. Y	3,050.00	8,000.00		11,050.00	7,950.00		3,100.00
Greenport, N. Y	1,284.02			1,284.02			1,284.02
Glen Cove, N. Y		8,000.00		8,000.00	8,000.00		

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1897, etc.—Continued.

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PUBLIC WORKS—continued.							
Military posts—Continued.							
Improving harbor at—Continued.							
Huntington, N. Y		$5,000.00		$5,000.00	$5,000.00		
Larchmont, N. Y	$120.95			120.95		$120.95	
Little Sodus Bay, N. Y	1,450.00	8,000.00		9,450.00	4,050.00		$5,400.00
Oak Orchard, N. Y	259.84			259.84		259.84	
Ogdensburg, N. Y		20,000.00		20,000.00	5,100.00		14,900.00
Olcott, N. Y	4,465.35			4,465.35			4,465.35
Oswego, N. Y	9,950.00	60,000.00		69,950.00	38,750.77		31,199.23
Port Chester, N. Y		5,000.00		5,000.00	5,000.00		
Port Jefferson, N. Y		7,500.00		7,500.00	3,000.00		4,500.00
Plattsburg, N. Y	239.25			239.25		239.25	
Pultneyville, N. Y		1,500.00		1,500.00	1,500.00		
Peekskill, N. Y		10,000.00		10,000.00	10,000.00		
Rondout, N. Y	2,000.00	2,500.00		4,500.00			4,500.00
Saugerties, N. Y	1,000.00	2,500.00		3,500.00	3,500.00		
Sacketts Harbor, N. Y	4,350.00			4,350.00	1,000.00		3,350.00
Mamaroneck, N. Y	220.55	10,000.00		10,220.55	10,000.00		220.55
Mattituck, N. Y		10,000.00		10,000.00	250.00		9,750.00
Wilson, N. Y	21.49	5,000.00		5,021.49	4,999.50		21.99
Improving—							
Tonawanda Harbor and Niagara River, N. Y	4,000.00	50,000.00		54,000.00	53,499.22		500.78
New York Harbor, N. Y	49,000.00	60,000.00		109,000.00	39,000.00		70,000.00
Harbor at Keyport, N. J		2,500.00		2,500.00			2,500.00
Raritan Bay, N. J		75,000.00		75,000.00	71,500.00		3,500.00
Shoal Harbor and Comptons Creek, N. J		5,000.00		5,000.00	5,000.00		
Harbor between Philadelphia, Pa., and Camden, N. J	211,000.00	1,294,000.00		1,505,000.00	914,500.00		590,500.00
Harbor at Erie, Pa	47,302.39			47,302.39	11,999.00		35,303.39
Ice harbor at—							
Marcus Hook, Pa	2,415.72			2,415.72			2,415.72
Newcastle, Del	40.05			40.05		40.05	
Reedy Island, Del	16,236.93			16,236.93			16,236.93
Harbor of refuge, Delaware Bay, Del		399,334.00		399,334.00	2,000.00		397,334.00
Constructing pier in Delaware Bay, near Lewes, Del		7,660.00		7,660.00			7,660.00
Improving harbor at Delaware Breakwater, Del	25,000.00	80,000.00		105,000.00	22,500.00		82,500.00
Removing obstructions from the harbor at Delaware Breakwater, Del	734.08			734.08			734.08
Board to determine route of Chesapeake and Delaware Canal, Del	2,436.29			2,436.29		2,436.29	
Improving harbor at—							
Wilmington, Del	10,250.00	20,000.00		30,250.00	5,500.00		24,750.00
Baltimore, Md		405,000.00		405,000.00	145,000.00		260,000.00

Annapolis, Md	1,524.58			1,524.58			1,524.58
Rock Hall, Md		16,600.00		16,600.00	6,600.00		10,000.00
Queenstown, Md		5,000.00		5,000.00	5,000.00		
Cape Charles City, Va		10,000.00		10,000.00	10,000.00		
Norfolk, Va		100,000.00		100,000.00	95,000.00		5,000.00
Beaufort, N. C	2,000.00	5,000.00		7,000.00	1,997.68		5,002.32
Improving Edenton Bay, N. C	2,447.41			2,447.41			2,447.41
Improving waterway between—							
Newbern and Beaufort, N. C	6,790.00		$295.61	7,085.61			7,085.61
Beaufort harbor and New River, N. C	4,000.00	1,000.00		5,000.00	4,000.00		1,000.00
Improving Winyaw Bay, S. C	8,000.00	370,000.00		378,000.00	18,000.00		360,000.00
Improving harbor at—							
Charleston, S. C	215,000.00			215,000.00	35,000.00		180,000.00
Georgetown, S. C	1,519.29			1,519.29			1,519.29
Improving—							
Outer Bar at Brunswick, Ga	233,722.74			233,722.74	2,000.23		231,722.51
Cumberland Sound, Ga. and Fla		355,000.00		355,000.00	5,000.00		350,000.00
Improving harbor at—							
Brunswick, Ga		15,000.00		15,000.00	15,000.00		
Darien, Ga		20,000.00		20,000.00	20,000.00		
Savannah, Ga	34,250.00	355,000.00		389,250.00	30,000.22		359,249.78
Improving—							
Apalachicola Bay, Fla		12,000.00		12,000.00	12,000.00		
Channel, Charlotte Harbor and Pease Creek, Fla		20,000.00		20,000.00	6,800.00		13,200.00
Carrabella Bar and Harbor, Fla		10,000.00		10,000.00	500.00		9,500.00
Tampa Bay, Fla	.96			.96		.96	
Jupiter Inlet, Fla	500.00			500.00	500.00		
Improving harbor at—							
Key West, Fla		80,000.00		80,000.00	5,500.00		74,500.00
Pensacola, Fla	54,000.00	200,000.00		254,000.00	40,022.41		213,977.59
Saint Augustine, Fla	6,000.10			6,000.10			6,000.10
Mobile, Ala		220,000.00		220,000.00	195,000.00		25,000.00
Improving ship channel in Galveston Bay, Tex		50,000.00		50,000.00	1,500.00		48,500.00
Improving harbor at—							
Vicksburg, Miss	35,000.00			35,000.00			35,000.00
Natchez and Vidalia, Miss. and La	65,000.00	64,000.00		129,000.00	20,000.00		109,000.00
Improving Biloxi Bay, Miss	617.73			617.73			617.73
Improving harbor at—							
New Orleans, La	9,000.00	110,000.00		119,000.00	69,000.00		50,000.00
St. Louis, Mo	31,000.00			31,000.00			31,000.00
Examination of improvements, mouth of Brazos River, Tex		5,000.00		5,000.00	4,000.00		1,000.00
Improving channel in West Galveston Bay, Tex		5,000.00		5,000.00			5,000.00
Improving harbor at—							
Brazos Santiago, Tex	57,476.00			57,476.00			57,476.00
Galveston, Tex	35,000.00	1,390,000.00		1,425,000.00	870,000.00		555,000.00
Ashtabula, Ohio	35,800.00	50,000.00		85,800.00	32,800.00		53,000.00
Black River, Ohio		30,000.00		30,000.00	17,000.00		13,000.00
Cleveland, Ohio	35,000.00	430,000.00		465,000.00	45,000.00		420,000.00
Fairport, Ohio	10,200.00	30,000.00		40,200.00	10,200.00		30,000.00
Huron, Ohio	2,000.00	8,000.00		10,000.00	10,000.00		
Port Clinton, Ohio	6,000.00	6,000.00		12,000.00			12,000.00
Sandusky City, Ohio	3,000.00	40,000.00		43,000.00	15,000.00		28,000.00

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1897, etc.—Continued.

Title of appropriation.	Balance July 1, 1896.	Appropriated July 1, 1896, to June 30, 1897.	Repayments July 1, 1896, to June 30, 1897.	Aggregate available.	Payments July 1, 1896, to June 30, 1897.	Carried to surplus fund June 30, 1897.	Balance June 30, 1897.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Improved harbor at—Continued.							
Toledo, Ohio	$200.00	$150,000.00		$150,200.00	$22,700.00		$127,500.00
Vermilion, Ohio	2,000.00	2,000.00		4,000.00	4,000.00		
Conneaut, Ohio		40,000.00		40,000.00	10,500.00		29,500.00
Improving Wolf Lake, Ind		8,000.00		8,000.00			8,000.00
Improving harbor at—							
Michigan City, Ind	20,000.00	80,000.00		100,000.00	2,000.00		98,000.00
Calumet, Ill		75,000.00		75,000.00	60,000.00		15,000.00
Waukegan, Ill	9,000.00	20,000.00		29,000.00	15,000.00		14,000.00
Chicago, Ill	30,000.00			30,000.00	25,000.00		5,000.00
Alpena, Mich	4,000.00	2,500.00		6,500.00			6,500.00
Harbor of refuge at—							
Grand Marais, Mich	5,981.01	24,000.00		29,981.01	8,981.01		21,000.00
Portage Lake, Mich	5,000.00	25,000.00		30,000.00	8,000.00		22,000.00
Marquette Bay, Mich		20,000.00		20,000.00	5,000.00		15,000.00
Sand Beach, Mich	97,500.00	16,000.00		113,500.00	4,500.00		109,000.00
Improving harbor at—							
Black Lake, Mich		10,000.00		10,000.00	5,000.00		5,000.00
Charlevoix, Mich	2,500.00	20,000.00		22,500.00	2,500.00		20,000.00
Frankfort, Mich	10,000.00	15,000.00		25,000.00	10,000.00		15,000.00
Grand Haven, Mich	17,500.00	20,000.00		37,500.00	5,500.00		32,000.00
Manistee, Mich		15,000.00		15,000.00	3,000.00		12,000.00
Cheboygan, Mich		12,000.00		12,000.00	3.05		11,996.95
Ludington, Mich		25,000.00		25,000.00	9,000.00		16,000.00
Manistique, Mich	2,044.95			2,044.95			2,044.95
Marquette, Mich	851.57	29,000.00		29,851.57	20,851.57		9,000.00
Monroe, Mich		5,000.00		5,000.00			5,000.00
Muskegon, Mich	15,000.00	30,000.00		45,000.00	19,000.00		26,000.00
Ontonagon, Mich	28.00	10,000.00		10,028.00	528.00		9,500.00
Pentwater, Mich	5,000.00	5,000.00		10,000.00	5,000.00		5,000.00
Petoskey, Mich		8,000.00		8,000.00	6,000.00		2,000.00
St. Joseph, Mich	47.20	30,000.00		30,047.20	14,000.00		16,047.20
South Haven, Mich	10,000.00	15,000.00		25,000.00	8,000.00		17,000.00
White River, Mich	5,000.00	5,000.00		10,000.00	5,000.00		5,000.00
Saugatuck, Mich	2,500.00	10,000.00		12,500.00	6,500.00		6,000.00
Au Sable, Mich	196.50			196.50		$196.50	
Improving—							
Eagle Harbor, Mich	1,007.23			1,007.23			1,007.23
Mouth and harbor of Cedar River, Mich	1,536.03			1,536.03			1,536.03

Improving harbor at—							
Ahnapee, Wis	2,000.00	5,000.00		7,000.00	500.00		6,500.00
Ashland, Wis		27,000.00		27,000.00	10,000.00		17,000.00
Green Bay, Wis		25,000.00		25,000.00	2,000.00		23,000.00
Kenosha, Wis	1,000.00	24,000.00		25,000.00	13,000.00		12,000.00
Kewaunee, Wis	2,000.00	25,000.00		27,000.00	7,000.00		20,000.00
Manitowoc, Wis	3,000.00	44,440.00		47,440.00	8,000.00		39,440.00
Menomonie, Wis		7,150.00		7,150.00	5,150.00		2,000.00
Milwaukee, Wis		7,000.00		7,000.00	7,000.00		
Oconto, Wis	500.00	4,000.00		4,500.00	4,500.00		
Pensaukee, Wis		1,000.00		1,000.00			1,000.00
Port Washington, Wis	31.75	5,500.00		5,531.75	2,500.00		3,031.75
Racine, Wis		27,000.00		27,000.00	19,000.00		8,000.00
Superior Bay and St. Louis Bay, Wis	900.00			900.00	900.00		
Sheboygan, Wis		26,000.00		26,000.00	12,000.25		13,999.75
Two Rivers, Wis		5,000.00		5,000.00	5,000.00		
South Milwaukee, Wis		5,000.00		5,000.00			5,000.00
Duluth, Minn., and Superior, Wis		487,500.00		487,500.00	41,000.00		446,500.00
Harbor of refuge at—							
Milwaukee Bay, Wis	1,000.00	188,737.91		189,737.91	16,000.26		173,737.65
Entrance of Sturgeon Bay Canal, Wis	500.00	5,000.00		5,500.00	2,500.00		3,000.00
Improving Minnesota Point at Superior, Wis	45.92			45.92		45.92	
Ice harbor at Dubuque, Iowa	4,503.99			4,503.99			4,503.99
Improving harbor at—							
Agate Bay, Minnesota	5,000.00	50,000.00		55,000.00	15,000.00		40,000.00
Memphis, Tenn		70,000.00		70,000.00	35,000.00		35,000.00
Grand Marais, Minn		3,000.00		3,000.00	2,500.00		500.00
Duluth, Minn	6,965.39			6,965.39	6,965.39		
Improving Humboldt Harbor and Bay, Cal	130,000.00	575,000.00		705,000.00	265,005.52		439,994.48
Improving harbor at—							
Oakland, Cal	11,449.74	220,000.00		231,449.74	4,500.00		226,949.74
Wilmington, Cal		50,000.00		50,000.00			50,000.00
San Luis Obispo, Cal	15,000.00	40,000.00		55,000.00	15,000.44		39,999.56
San Diego, Cal		50,000.00		50,000.00	50,000.00		
Survey of San Francisco Harbor, San Pablo and Suisun bays, Strait of Carquinez and mouths of San Joaquin and Sacramento rivers, Cal	1,000.00			1,000.00		1,000.00	
Survey of Pacific Coast, between Points Duma and Capistrane, Cal	3,349.22			3,349.22			3,349.22
Examination for deep-water harbor at San Pedro or Santa Monica bays, Cal	6,574.96	50,000.00		56,574.96	40,013.45		16,561.51
Improving—							
Entrance to Coos Bay and Harbor, Oreg	12,499.97	109,390.00		121,889.97	55,000.00		66,889.97
Tillamook Bay and Bar, Oreg	1,000.00	17,000.00		18,000.00	18,000.00		
Nehalem Bay, Oreg	9,584.92			9,584.92			9,584.92
Yaquina Bay, Oreg		25,000.00		25,000.00	6.46		24,993.54
Harbor at Port Orford, Oreg	140,858.52			140,858.52			140,858.52
Grays Harbor and Chehalis River, Wash	288.83			288.83	.20		288.63
Harbor at—							
Olympia, Wash		32,000.00		32,000.00	31,000.00		1,000.00
Everett, Wash		20,000.00		20,000.00	20,000.00		
Grays Harbor, Wash		370,000.00		370,000.00	1,500.00		368,500.00
Survey of Portland Channel, Alaska		5,000.00		5,000.00	5,000.00		

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1897, etc.—Continued.

Title of appropriation.	Balance July 1, 1896.	Appropriated July 1, 1896, to June 30, 1897.	Repayments July 1, 1896, to June 30, 1897.	Aggregate available.	Payments July 1, 1896, to June 30, 1897.	Carried to surplus fund June 30, 1897.	Balance June 30, 1897.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Ship channel connecting waters of the Great Lakes between Chicago, Duluth, and Buffalo	$38,587.43	$1,590,000.00		$1,628,587.43	$506,782.83		$1,121,804.60
Surveys and examination of waterways between the Great Lakes and Atlantic Ocean		150,000.00		150,000.00			150,000.00
Improving—							
Lubec Channel, Me		32,000.00		32,000.00			32,000.00
Moosabec Bar, at Jonesport, Me		12,000.00		12,000.00			12,000.00
Bagaduce River, Me		5,000.00		5,000.00	24.84		4,975.16
Georges River, Me		10,000.00		10,000.00			10,000.00
Harrisseckit River, Me	36.38			36.38			36.38
Kennebunk River, Me	1,507.50			1,507.50			1,507.50
Kennebec River, Me	20,000.00	55,000.00		75,000.00	25,002.02		49,997.98
Penobscot River, Me	9,999.41			9,999.41			9,999.41
Narragaugus River, Me		5,000.00		5,000.00			5,000.00
Saco River, Me		10,000.00		10,000.00			10,000.00
St. Croix River, Me	10,000.00			10,000.00	10,000.00		
Sasanoa River, Me		19,000.00		19,000.00	3,000.00		16,000.00
Union River, Me		15,000.00		15,000.00			15,000.00
Bellamy River, N. H	2,000.00			2,000.00	1,642.98		357.02
Cocheco River, N. H	5,000.00	15,000.00		20,000.00	5,000.00		15,000.00
Otter Creek, Vt	5,043.40	5,000.00		10,043.40	10,043.40		
Ipswich River, Mass	1,882.09			1,882.09			1,882.09
Merrimac River, Mass		5,000.00		5,000.00	3,693.95		1,306.05
Powow River, Mass	21,000.00	12,000.00		33,000.00	33,000.00		
Taunton River, Mass		5,000.00		5,000.00	5,000.00		
Town River, Mass		10,000.00		10,000.00	100.00		9,900.00
Weymouth River, Mass	2,500.00	15,000.00		17,500.00			17,500.00
Mystic and Malden rivers, Mass		10,000.00		10,000.00			10,000.00
Essex River, Mass		5,000.00		5,000.00			5,000.00
Removing Green Jacket Shoal, Providence River, R. I		7,500.00		7,500.00	7,500.00		
Improving—							
Providence River and Narragansett Bay, R. I	4,108.48	150,000.00		154,108.48	12,000.00		142,108.48
Pawcatuck River, R. I	899.99	15,000.00		15,899.99	5,500.00		10,399.99
Pawtucket River, R. I	2,000.00	20,500.00		22,500.00	2,000.00		20,500.00
Sakonnet River, R. I		20,000.00		20,000.00			20,000.00
Connecticut River, between Hartford and Holyoke, Conn	8,940.30			8,940.30	2,000.00		6,940.30
Connecticut River, Conn	9,000.00	20,000.00		29,000.00	14,000.00		15,000.00
Mystic River, Conn		3,500.00		3,500.00	1,000.00		2,500.00
Housatonic River, Conn	5,500.00	25,000.00		30,500.00	16,000.00		14,500.00

Thames River, Conn	7,000.00	12,000.00		19,000.00	7,000.00		12,000.00
Removing obstructions in East River and Hell Gate, N. Y	5,000.00	60,000.00		65,000.00	50,000.00		15,000.00
Improving—							
Browns Creek, N. Y		4,000.00		4,000.00	2,000.00		2,000.00
East Chester Creek, N. Y		10,000.00		10,000.00			10,000.00
Bronx River, N. Y		10,000.00		10,000.00	10,000.00		
Great Chazy River, N. Y	68.98			68.98			68.98
Patchogue River, N. Y		13,000.00		13,000.00	10,000.00		3,000.00
St. Lawrence River, N. Y	2,000.00	25,000.00		27,000.00	500.00		26,500.00
Harlem River, N. Y	5,000.00	125,000.00		130,000.00	20,000.00		110,000.00
Hudson River, N. Y	125,000.00	955,000.00		1,080,000.00	560,000.00		520,000.00
Newtown Creek, N. Y		213,000.00		213,000.00	25,500.00		187,500.00
Niagara River, N. Y	3,100.00	15,000.00		18,100.00	8,100.00		10,000.00
Cooper Creek, N. J		37,000.00		37,000.00	7,500.00		29,500.00
Goshen Creek, N. J	3,000.00	3,000.00		6,000.00	6,000.00		
Alloway Creek, N. J		3,000.00		3,000.00	3,000.00		
Dennis Creek, N. J		5,000.00		5,000.00	5,000.00		
Mattawan Creek, N. J		3,000.00		3,000.00			3,000.00
Elizabeth River, N. J		3,160.00		3,160.00			3,160.00
Passaic River, N. J	2,000.00	15,000.00		17,000.00	17,000.00		
Shrewsbury River, N. J		15,000.00		15,000.06	12,000.00		3,000.00
South River, N. J		5,000.00		5,000.00	4,500.00		500.00
Raccoon River, N. J	2,242.77			2,242.77			2,242.77
Squan River, N. J	2,000.00			2,000.00			2,000.00
Rancocas River, N. J	399.70	2,000.00		2,399.70	500.00		1,899.70
Raritan River, N. J		20,000.00		20,000.00	9,000.00		11,000.00
Frankford Creek, Pa	2,000.00			2,000.00			2,000.00
Dam at Herrs Island, Allegheny River, near Pittsburg, Pa	5,000.00	400,000.00		405,000.00	45,000.00		360,000.00
Purchase of upper lock and dam, Monongahela River, between Pittsburg, Pa., and Morgantown, W. Va.	323,333.13			323,333.13			323,333.13
Cost of condemnation of upper lock and dam, Monongahela River, between Pittsburg, Pa., and Morgantown, W. Va.	5,098.64			5,098.64			5,098.64
Cost of condemnation—property of Monongahela Navigation Company		5,000.00		5,000.00	2,500.00		2,500.00
Survey of Delaware River between Philadelphia, Pa., and Camden, N. J	4,465.28			4,465.28			4,465.28
Improving—							
Allegheny River, Pa	6,000.00	12,500.00		18,500.00	11,500.00		7,000.00
Schuylkill River, Pa	4,000.00	20,000.00		24,000.00	9,700.00		14,300.00
Delaware River, Pa. and N. J	144,010.60	500,000.00		644,010.60	151,500.00		492,510.60
Murderkill River, Del		6,500.00		6,500.00	6,500.00		
Mispillion Creek, Del	4,350.00			4,350.00			4,350.00
Appoquinimink River, Del	4,000.00	5,000.00		9,000.00			9,000.00
Smyrna River, Del	2,000.00	5,000.00		7,000.00	2,000.00		5,000.00
Broad Creek, Del		5,000.00		5,000.00			5,000.00
Choptank River, Md		2,000.00		2,000.00			2,000.00
Chester River, Md	2,958.54	1,500.00		4,458.54			4,458.54
Nanticoke River, Del. and Md		3,000.00		3,000.00	150.00		2,850.00
Manokin River, Md		4,000.00		4,000.00			4,000.00
Patuxent River, Md	382.70			382.70			382.70
Susquehanna River, near Havre de Grace, Md	10,000.00			10,000.00			10,000.00
Wicomico River, Md		3,700.00		3,700.00			3,700.00
Patapsco River, Md	12,000.00	50,000.00		62,000.00			62,000.00
Pocomoke River, Md		5,000.00		5,000.00	5,000.00		

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1897, etc.—Continued.

Title of appropriation.	Balance July 1, 1896.	Appropriated July 1, 1896, to June 30, 1897.	Repayments July 1, 1896, to June 30, 1897.	Aggregate available.	Payments July 1, 1896, to June 30, 1897.	Carried to surplus fund June 30, 1897.	Balance June 30, 1897.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Improving—Continued:							
Potomac River	$55,463.06	$100,000.00		$155,463.06	$39,000.64		$116,462.42
Warwick River, Md		2,000.00		2,000.00			2,000.00
Protecting Jamestown Island, Va		15,000.00		15,000.00			15,000.00
Improving—							
Waterway from Chincoteague Bay to Indian River Bay, Va., Md., and Del		25,000.00		25,000.00			25,000.00
Nandua Creek, Va		3,000.00		3,000.00			3,000.00
Aquia Creek, Va		3,000.00		3,000.00			3,000.00
Occoquan Creek, Va		2,500.00		2,500.00	200.00		2,300.00
Nomini Creek, Va	1,000.00	2,500.00		3,500.00	1,200.00		2,300.00
Urbana Creek, Va		3,000.00		3,000.00	200.00		2,800.00
Appomattox River, Va	120.00	5,000.00		5,120.00	540.00		4,580.00
James River, Va		120,000.00		120,000.00	63,000.00		57,000.00
Elizabeth River, Va		45,000.00		45,000.00	30,000.00		15,000.00
Mattapony River, Va	1,500.00	2,500.00		4,000.00			4,000.00
Nansemond River, Va		5,000.00		5,000.00	100.00		4,900.00
Pamunkey River, Va	1,500.00	2,000.00		3,500.00			3,500.00
Rappahannock River, Va	3,000.00	8,000.00		11,000.00	1,200.00		9,800.00
Staunton River, Va	8,084.77			8,084.77			8,084.77
York River, Va	2,500.00	16,000.00		18,500.00	700.00		17,800.00
North Landing River, Va. and N. C	300.00			300.00	300.00		
New River, Va. and W. Va	2,308.94			2,308.94			2,308.94
Dan River, Va. and N. C	39.63			39.63		$39.63	
Lower Machodoc Creek, Va		1,500.00		1,500.00	.20		1,499.80
Elk River, W. Va	1,500.00	2,000.00		3,500.00	3.70		3,496.30
Big Sandy River, W. Va. and Ky	8,000.00	33,000.00		41,000.00	33,500.00		7,500.00
Cheat River, W. Va	3.16			3.16		3.16	
Gauley River, W. Va	500.00	3,000.00		3,500.00			3,500.00
Guyandotte River, W. Va		1,000.00		1,000.00	1,000.00		
Little Kanawha River, W. Va		1,500.00		1,500.00			1,500.00
Monongahela River, W. Va	38,500.00	380,000.00		418,500.00	6,500.00		412,000.00
Shenandoah River, W. Va	16,020.49			16,020.49			16,020.49
Great Kanawha River, W. Va	466,719.31	273,000.00		739,719.31	200,000.20	1,086.31	538,632.80
Waterway from Norfolk Harbor, Va., to Albemarle Sound, N. C	800.00	10,000.00		10,800.00	2,000.00		8,800.00
Ocracoke Inlet, N. C	52,500.00			52,500.00	37,500.00		15,000.00
Waterway between New River and Swansboro, N. C	4,376.27			4,376.27			4,376.27
Contentnia Creek, N. C	3,500.00			3,500.00	2,000.00		1,500.00
Fishing Creek, N. C	14,962.97			14,962.97	6,962.97		8,000.00

Mackeys Creek, N. C	356.12			356.12		356.12	
Cape Fear River, N. C	71,000.00	200,000.00		271,000.00	96,981.00		174,019.00
Pasquotank River, N. C	1,500.00			1,500.00			1,500.00
New River, N. C	3,500.00			3,500.00			3,500.00
Neuse River, N. C	3,003.00	7,000.00		10,003.00	8,000.00		2,003.00
Lockwoods Folly River, N. C			$181.49	181.49			181.49
Lumber River, N. C	500.00			500.00	500.00		
Pamlico and Tar rivers, N. C	5,000.00	5,000.00		10,000.00	5,000.00		5,000.00
Roanoke River, N. C	33,006.76	10,000.00		43,006.76	3,500.00		39,506.76
Trent River, N. C	13.50	2,000.00		2,013.50	1,000.00		1,013.50
Yadkin River, N. C	4,497.12			4,497.12			4,497.12
Waccamaw River, N. C. and S. C	500.00	6,000.00		6,500.00	4,000.00		2,500.00
Black River, N. C		1,000.00		1,000.00	1,000.00		
Survey of waterways connecting Dismal Swamp Canal, Va., with sounds of North Carolina	400.00		.90	400.90			400.90
Improving—							
Mingo Creek, S. C	500.00			500.00	500.00		
Wappoo Cut, S. C	1,514.29	2,500.00		4,014.29	1,628.76		2,385.53
Beaufort River, S. C		1,000.00		1,000.00	1,000.00		
Congaree River, S. C	1,500.00	2,000.00		3,500.00	2,000.00		1,500.00
Edisto River, S. C			282.35	282.35			282.35
Great Pedee River, S. C	500.00	12,000.00		12,500.00	5,000.00		7,500.00
Little Pedee River, S. C	500.00	3,000.00		3,500.00	2,000.00		1,500.00
Salkahatchie River, S. C	2,159.27			2,159.27			2,159.27
Santee River, S. C	5,000.00	48,000.00		53,000.00	28,000.00		25,000.00
Wateree River, S. C		5,000.00		5,000.00	2,500.00		2,500.00
Altamaha River, Ga		10,000.00		10,000.00	5,000.00		5,000.00
Chattahoochee River, Ga. and Ala	7,000.00	25,000.00		32,000.00	17,000.00		15,000.00
Flint River, Ga	500.00	8,000.00		8,500.00	5,000.00		3,500.00
Ocmulgee River, Ga		10,000.00		10,000.00	6,500.00		3,500.00
Oconee River, Ga		10,000.00		10,000.00	6,000.00		4,000.00
Oostenaula and Coosawattee rivers, Ga	499.39			499.39		499.39	
Savannah River, Ga		18,000.00		18,000.00	7,000.00		11,000.00
Coosa River, Ga. and Ala	15,018.27	100,000.00		115,018.27	40,000.00		75,018.27
Waterway between Savannah, Ga., Fernandina, Fla		14,000.00		14,000.00	6,000.00		8,000.00
Improving—							
La Grange Bayou, Fla	4,839.20			4,839.20			4,839.20
Sarasota Bay, Fla		2,500.00		2,500.00			2,500.00
Volusia Bar, Fla	1,000.00	1,000.00		2,000.00	2,000.00		
Ocklawaha River, Fla		3,000.00		3,000.00			3,000.00
Apalachicola River, Fla		5,000.00		5,000.00	5,000.00		
Choctawhatchee River, Fla. and Ala		5,000.00		5,000.00	4,000.00		1,000.00
Caloosahatchee River, Fla		1,000.00		1,000.00			1,000.00
Escambia and Conecuh Rivers, Fla. and Ala		4,000.00		4,000.00	4,000.00		
Manatee River, Fla		4,000.00		4,000.00	1,000.00		3,000.00
Surveys, Biscayne Bay and Palm Beach, Fla			10.75	10.75			10.75
Improving—							
St. Johns River, Fla		200,000.00		200,000.00	59,695.71		140,304.29
Suwanee River, Fla		3,000.00		3,000.00	3.30		2,996.70
Withlacoochee River, Fla	785.12			785.12			785.12
Indian River, Fla	5,000.00	7,500.00		12,500.00	5,000.00		7,500.00
Investigating obstructions to navigation by the water hyacinth		5,000.00		5,000.00			5,000.00

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1897, etc.—Continued.

Title of appropriation.	Balance July 1, 1896.	Appropriated July 1, 1896, to June 30, 1897.	Repayments July 1, 1896, to June 30, 1897.	Aggregate available.	Payments July 1, 1896, to June 30, 1897.	Carried to surplus fund June 30, 1897.	Balance June 30, 1897.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Improving—Continued.							
Alabama River, Ala		$40,000.00		$40,000.00	$33,039.74		$6,960.26
Black Warrior River, Ala	$15,000.00	10,000.00		25,000.00	7,500.00		17,500.00
Tallapoosa River, Ala	28.08			28.08		$28.08	
Warrior and Tombigbee rivers, Ala. and Miss	138,000.00	204,000.00		342,000.00	131,000.00		211,000.00
Yazoo River, Miss	189,100.00	370,000.00		559,100.00	44,100.31		514,999.69
Big Sunflower River, Miss		5,000.00		5,000.00			5,000.00
Chickasahay River, Miss		2,000.00		2,000.00	2,000.00		
Leaf River, Miss	2,500.00	2,500.00		5,000.00	5,000.00		
Noxubee River, Miss		3,000.00		3,000.00			3,000.00
Pascagoula River, Miss	5,000.00	6,000.00		11,000.00	11,000.00		
Pearl River, Miss		12,900.00		12,900.00	8,000.00		4,900.00
Tallahatchee River, Miss		4,000.00		4,000.00	4,000.00		
Mississippi River	895,720.14	3,808,333.00		4,704,053.14	1,397,524.67		3,306,528.47
Mississippi River from Minneapolis to Des Moines Rapids, Minn., Iowa, Mo., Ill., and Wis	3,000.00			3,000.00			3,000.00
Mississippi River from mouth of the Ohio River to Minneapolis, Minn	625,258.30	2,075,000.00		2,700,258.30	909,758.30		1,790,500.00
Mississippi River between mouths of Ohio and Illinois rivers, Ill. and Mo	31,100.00			31,100.00			31,100.00
Closing crevasse in Pass à Loutre, Mississippi River		250,000.00		250,000.00	2,000.00		248,000.00
Preventing break in Mississippi River at Beach Ridge, Ill		100,000.00		100,000.00			100,000.00
Gauging the waters of the Lower Mississippi and its tributaries		6,000.00		6,000.00	5,854.17		145.83
Reservoirs at head waters of Mississippi River	1,340.26	80,000.00		81,340.26	13,911.68		67,428.58
Operating snag and dredge boats on Upper Mississippi River		25,000.00		25,000.00	25,000.00		
Constructing jetties and other works at South Pass, Mississippi River		87,500.00		87,500.00	87,500.00		
Removing obstructions in Mississippi River	15,000.00	100,000.00		115,000.00	83,495.06		31,504.94
Examinations and surveys at South Pass, Mississippi River		10,000.00		10,000.00	8,871.94		1,128.06
Mississippi River Commission	50.40			50.40		50.40	
Improving—							
Bayou Vermilion, La		1,000.00		1,000.00			1,000.00
Bogue Chitto, La		5,000.00		5,000.00	3,000.00		2,000.00
Bayou Boeuf, La	2,000.00	6,000.00		8,000.00			8,000.00
Bayou Bartholomew, La. and Ark	2,000.00	4,000.00		6,000.00	6,000.00		
Bayou Courtableau, La		2,500.00		2,500.00			2,500.00
Bayou Black, La	319.31			319.31		319.31	
Bayou Plaquemine, La	87,007.77	370,000.00		457,007.77	34,600.00		422,407.77
Bayou Teche		10,000.00		10,000.00	10,000.00		
Connecting Bayou Teche with Grand Lake at Charenton, La	22,100.05			22,100.05			22,100.05

Improving—							
Bayou Terrebonne, La	158.90			158.90		158.90	
Bayou Lafourche, La	51,000.00	25,000.00		76,000.00	16,300.00		59,700.00
Amite River, La	2.50	2,500.00		2,502.50			2,502.50
Calcasieu River and Pass, La	21,864.00	80,000.00		101,864.00	89,100.00		12,764.00
Tensas River, La		5,000.00		5,000.00	.70		4,999.30
Tickfaw River, La		1,000.00		1,000.00	1,000.00		
Tchefuncte River, La		1,000.00		1,000.00			1,000.00
Red River, La. and Ark	35,469.11	100,000.00		135,469.11	38,069.11		97,400.00
Mermentau River, La	5,000.00	5,000.00		10,000.00			10,000.00
Atchafalaya and Red River, La	52,500.00	40,000.00		92,500.00	12,000.00		80,500.00
Sabine Pass, Tex	33,700.00	425,000.00		458,700.00	37,200.00		421,500.00
Aransas Pass and Bay, Tex	40,667.35			40,667.35			40,667.35
Mouth of Brazos River, Tex	16,651.57			16,651.57			16,651.57
Brazos River, Tex		5,000.00		5,000.00			5,000.00
Passo Caballo, Tex	35,368.78			35,368.78			35,368.78
Buffalo Bayou, Tex		20,000.00		20,000.00	1,500.00		18,500.00
Cypress Bayou, Tex. and La	10,000.00	5,000.00		15,000.00			15,000.00
Trinity River, Tex	2,700.00	5,000.00		7,700.00	100.00		7,600.00
Ouachita River, Ark. and La	7,476.88	70,000.00		77,476.88	27,476.88		50,000.00
Sabine River, Tex		2,000.00		2,000.00			2,000.00
Removing obstructions in Arkansas River, Ark. and Kans		20,000.00		20,000.00	3,004.46		16,995.54
Improving—							
Black River, Ark. and Mo	3,000.00	8,000.00		11,000.00	6,000.00		5,000.00
Fourche Le Fevre River, Ark	892.75			892.75			892.75
St. Francis River, Ark	299.73	8,000.00		8,299.73	5,394.35		2,905.38
Red River, above Fulton, Ark		3,000.00		3,000.00			3,000.00
Arkansas River, Ark	55,595.50	100,000.00		155,595.50	106,276.34		49,319.16
Examination of improvements at Aransas Pass, Tex		5,000.00		5,000.00			5,000.00
Improving—							
White River, Ark	11,550.00	22,000.00		33,550.00	8,086.04		25,463.96
Caney Fork River, Tenn	20.00			20.00		20.00	
Current River, Ark. and Mo	1,300.00	2,000.00		3,300.00	1,800.68		1,499.32
Clinch River, Tenn	4,000.00			4,000.00			4,000.00
Cumberland River, below Nashville, Tenn	24,000.00	80,000.00		104,000.00	21,000.00		83,000.00
Cumberland River, above Nashville, Tenn	115,000.00	370,000.00		485,000.00	80,000.00		405,000.00
French Broad River, Tenn		5,000.00		5,000.00			5,000.00
Forked Deer River, Tenn		6,000.00		6,000.00	3,000.00		3,000.00
Tennessee River above Chattanooga, Tenn	24,500.00	15,000.00		39,500.00	17,500.00		22,000.00
Tennessee River below Chattanooga, Tenn., Ala., and Ky	409,014.36	50,000.00		459,014.36	217,805.07		241,209.29
Obeys River, Tenn	17.86			17.86		17.86	
Obion River, Tenn	500.00	6,000.00		6,500.00	1,500.00		5,000.00
South Fork Cumberland River, Ky	32.98			32.98		32.98	
Falls of the Ohio River at Louisville, Ky		360,000.00		360,000.00	2,500.00		357,500.00
Kentucky River, Ky	77,870.86	333,000.00		410,870.86	150,870.86		260,000.09
Rough River, Ky		43,000.00		43,000.00	35,000.00		8,000.00
Tradewater River, Ky	485.00			485.00	75.00		410.00
Green River, Ky	77,788.12	20,000.00		97,788.12	12,600.00		85,188.12
Survey of the Ohio River below Pittsburg, Pa	9,565.92			9,565.92			9,565.92
Improving—							
Muskingum River, Ohio	5,000.00			5,000.00			5,000.00
Ohio River, below Pittsburg, Pa	152,000.00	755,000.00		907,000.00	75,000.00		832,000.00

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1897, etc.—Continued.

Title of appropriation.	Balance July 1, 1896.	Appropriated July 1, 1896, to June 30, 1897.	Repayments July 1, 1896, to June 30, 1897.	Aggregate available.	Payments July 1, 1896, to June 30, 1897.	Carried to surplus fund June 30, 1897.	Balance June 30, 1897.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Improving—Continued.							
Ohio River	$131,617.61	$250,000.00		$381,617.61	$117,227.50		$264,390.11
Operating snag boats on Ohio River	92.31	50,000.00		50,092.31	49,990.00		102.31
Examination of Portage Lake and Lake Superior ship canals	2,310.92			2,310.92			2,310.92
Improving—							
Detroit River, Mich	30,000.00	30,000.00		60,000.00	10,000.00		50,000.00
Hay Lake Channel Sault Ste. Marie River, Mich	265,000.00			265,000.00	45,000.00		220,000.00
St. Clair Flats Canal, Mich	4,720.71			4,720.71			4,720.71
Black River, Mich	6,500.00	8,000.00		14,500.00	6,500.00		8,000.00
Belle River, Mich		5,000.00		5,000.00	3,000.00		2,000.00
Clinton River, Mich	4,000.00	10,000.00		14,000.00	2,000.00		12,000.00
Grand River, Mich		50,000.00		50,000.00	10,000.00		40,000.00
Improving—							
Menominee River, Mich. and Wis		15,000.00		15,000.00	7,000.00		8,000.00
Saginaw River, Mich		40,000.00		40,000.00	2,000.00		38,000.00
Rouge River, Mich	5,000.00	5,000.00		10,000.00			10,000.00
Pine River, Mich		5,000.00		5,000.00	5,000.00		
St. Joseph River, Mich		500.00		500.00	500.00		
Sebewaing River, Mich		5,000.00		5,000.00			5,000.00
St. Marys River and St. Marys Falls Canal	182.31			182.31		$182.31	
St. Marys River, Mich	1,371,061.08			1,371,061.08	180,000.67		1,191,060.41
Thunder Bay River, Mich	2,000.00			2,000.00			2,000.00
Kalamazoo River, Mich		5,000.00		5,000.00	1,000.00		4,000.00
Waterway from Keweenaw Bay to Lake Superior, Mich	2,999.08	400,000.00		402,999.08	17,999.08		385,000.00
Turning Basin, Rouge River, Mich	2,000.00		$3,000.00	5,000.00			5,000.00
Sturgeon Bay and Lake Michigan Ship Canal, Wis	1,000.00	30,000.00		31,000.00	16,892.85		14,107.15
Improving—							
Chippewa River, Wis		10,000.00		10,000.00	5,000.64		4,999.36
St. Croix River, Wis. and Minn		15,000.00		15,000.00	7,999.50		7,000.50
Fox River, Wis	1,004.76	37,500.00		38,504.76	3,000.00		35,504.76
Damages by improvement of Fox and Wisconsin rivers	400.00			400.00	400.00		
Investigating property rights of United States in improvement of Fox and Wisconsin rivers		3,000.00		3,000.00			3,000.00
Improving—							
Minnesota River, Minn		4,000.00		4,000.00	4,000.00		
Red River of the North, Minn and Dak	78.44	20,000.00		20,078.44	13,818.15		6,260.29
White River, Ind		2,500.00		2,500.00	2,500.00		
Wabash River, Ind. and Ill		21,000.00		21,000.00	13,500.00		7,500.00
Illinois and Mississippi Canal	.50	920,000.00		920,000.50	25,000.00		895,000.50

Improving—							
Chicago River, Ill		163,000.00		163,000.00	40,000.00		123,000.00
Calumet River, Ill. and Ind	6,500.00	50,000.00		56,500.00	33,500.00		23,000.00
Kaskaskia River, Ill	39.20			39.20		39.20	
Illinois River, Ill		40,000.00		40,000.00	25,000.00		15,000.00
Missouri River from mouth to Sioux City, Iowa	45,657.35	600,000.00		645,657.35	289,444.35		356,213.00
Osage River, Mo. and Kans	55,500.00	50,000.00		105,500.00	55,725.87		49,774.13
Gasconade River, Mo		5,000.00		5,000.00	5,000.00		
St. Francis River, Mo	2,070.53			2,070.53	2,070.53		
Missouri River	1,027.45			1,027.45	879.53		147.92
Missouri River, from Stubbs Ferry, Mont., to Sioux City, Iowa	5,582.50	285,000.00		290,582.50	133,105.49		157,477.01
Yellowstone River, Mont. and Dak	11,720.41	10,000.00		21,720.41	8,509.89		13,210.52
Examination of Missouri River from Three Forks to Canyon Ferry, Mont	754.01			754.01			754.01
Improving—							
Flathead River, Mont		10,000.00		10,000.00	1,200.00		8,800.00
Napa River, Cal		4,000.00		4,000.00			4,000.00
Sacramento and Feather rivers, Cal	113,221.42	250,000.00		363,221.42	46,037.58		317,183.84
San Joaquin River, Cal	13,988.39	57,750.00		71,738.39	6,008.09		65,730.30
Coos River, Oreg		5,000.00		5,000.00	1,000.00		4,000.00
Mouth of Columbia River, Oreg. and Wash	67,180.00			67,180.00	13,033.98		54,146.02
Alsea River, Oreg		3,000.00		3,000.00	3,000.00		
Columbia River, at Cascades, Oreg	112,651.72	229,597.00		342,248.72	342,248.72		
Nestucca River, Oreg		6,000.00		6,000.00	6,000.00		
Columbia and Lower Willamette rivers, below Portland, Oreg	2,500.00	100,000.00		102,500.00	30,157.90		72,342.10
Willamette and Yamhill Rivers, Oreg		200,000.00		200,000.00	21,508.50		178,491.50
Examination and survey of Columbia River, Oreg	3,169.49			3,169.49			3,169.49
Gauging waters of Columbia River, Oreg		1,000.00		1,000.00	750.00		250.00
Improving—							
Coquille River, Oreg	2,700.00	32,000.00		34,700.00	11,700.00		23,000.00
Siuslaw River, Oreg	500.00	27,000.00		27,500.00	13,750.00		13,750.00
Upper Columbia and Snake rivers, Oreg. and Wash	2,200.00	5,000.00		7,200.00	4,618.68		2,581.32
Umpqua River, Oreg		6,000.00		6,000.00	6,000.00		
Willamette River above Portland, Oreg	500.00			500.00	500.00		
Examinations of obstructions in Columbia River	520.51			520.51			520.51
Improving—							
Columbia River at Three Mile Rapids, Oreg. and Wash	93,300.00	150,000.00		243,300.00	6,536.95		236,763.05
Willapa River and Harbor, Wash	2,650.00			2,650.00			2,650.00
Columbia River from Rock Island Rapids to Priest Rapids, Wash	2.00			2.00	2.00		
Chehalis River, Wash		3,000.00		3,000.00	3,000.00		
Cowlitz River, Wash		3,000.00		3,000.00	1,800.00		1,200.00
Puget Sound, Wash	5,001.80	75,000.00		80,001.80	19,502.55		60,499.25
Swinomish Slough, Wash	4,000.00	25,000.00		29,000.00	26,000.00		3,000.00
Columbia River, Wash		67,000.00		67,000.00	500.00		66,500.00
Waterway connecting Puget Sound with Lakes Union and Washington	20,000.00	150,000.00		170,000.00	1.00		169,999.00
Clearwater River, Idaho		25,000.00		25,000.00	7,335.02		17,664.98
Kootenai River, Idaho		5,000.00		5,000.00	2,200.00		2,800.00
Colorado River, at Yuma, Ariz	218.25			218.25		218.25	
Upper Snake River, Idaho	4,500.00			4,500.00			4,500.00
Surveys for deep-water harbor, Gulf of Mexico	766.96			766.96		766.96	

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1897, etc.—Continued.

Title of appropriation.	Balance July 1, 1896.	Appropriated July 1, 1896, to June 30, 1897.	Repayments July 1, 1896, to June 30, 1897.	Aggregate available.	Payments July 1, 1896, to June 30, 1897.	Carried to surplus fund June 30, 1897.	Balance June 30, 1897.
PUBLIC WORKS—continued.							
Harbors and rivers—Continued.							
Operating and care of canals and other works of navigation		$672,795.45		$672,795.45	$672,795.45		
Removing sunken vessels or craft obstructing or endangering navigation		31,409.40		31,409.40	31,409.40		
Examinations, surveys, and contingencies of rivers and harbors	$71,562.66	200,000.00		271,562.66	131,834.68		$139,727.98
Total harbors and rivers	9,876,985.43	36,606,264.76	$3,771.10	46,487,021.29	13,686,874.91	$8,518.50	32,791,627.88
Repayments in excess of payments					3,771.10		
Actual expenditures					13,683,103.81		
MISCELLANEOUS OBJECTS.							
Signal Service.							
Road to the signal station on Pikes Peak, Colo	10,000.00			10,000.00			10,000.00
Military road from El Paso, Tex., to New Fort Bliss, Tex		4,000.00		4,000.00	4,000.00		
Military telegraph line from Fort Ringgold, Tex., to Fort McIntosh, Tex	67.63			67.63			67.63
Military telegraph line, El Paso, Tex., and New Fort Bliss, Tex	166.66		88.23	254.89			254.89
Total Signal Service	10,234.29	4,000.00	88.23	14,322.52	4,000.00		10,322.52
Repayments in excess of payments					88.23		
Actual expenditures					3,911.77		
National cemeteries.							
National cemeteries	4,649.61	100,000.00		104,649.61	90,830.43	710.80	13,108.38
Pay of superintendents of national cemeteries	936.00	61,880.00		62,816.00	61,829.67	833.01	153.32
Repairing roads to national cemeteries	1,607.21	8,000.00		9,607.21	7,826.03	1,500.29	280.89
Road to the national cemetery at Hampton, Va	2,000.00			2,000.00			2,000.00
Road to the national cemetery, Illinois	15,000.00			15,000.00	15,000.00		
Road to the national cemetery, Presidio of San Francisco, Cal		10,000.00		10,000.00	10,000.00		
Military cemetery at Key West, Fla		2,058.00		2,058.00	2,058.00		
Headstones for graves of soldiers	13,415.17	20,000.00		33,415.17	30,203.46	1,742.09	1,469.62
Burial of indigent soldiers	4,200.00	3,000.00		7,200.00	3,031.83	1,801.67	2,366.50
Total national cemeteries	41,807.99	204,938.00		246,745.99	220,779.42	6,587.86	19,378.71

Artificial limbs and appliances.							
Artificial limbs	1,956.19	575,000.00		576,956.19	564,970.21	2,451.12	9,534.86
Appliances for disabled soldiers	1,240.00	2,000.00		3,240.00	1,066.85	1,273.15	900.00
Trusses for disabled soldiers		10,000.00		10,000.00	10,000.00		
Total artificial limbs and appliances	3,196.19	587,000.00		590,196.19	576,037.06	3,724.27	10,434.86
Civil surveys.							
Survey of road from Aqueduct Bridge to Mount Vernon	2,112.71			2,112.71		2,112.71	
Survey of northern and northwestern lakes	4,396.40	27,000.00		31,396.40	22,996.41		8,399.99
Total civil surveys	6,509.11	27,000.00		33,509.11	22,996.41	2,112.71	8,399.99
Miscellaneous.							
Arming and equipping the militia	520,343.44	400,000.00		920,343.44	500,497.26		419,846.18
Seacoast batteries for instruction of militia			758.82	758.82			758.82
Infantry and Cavalry School, Fort Leavenworth, Kans		1,500.00		1,500.00	1,500.00		
Artillery School, Fortress Monroe, Va		5,000.00		5,000.00	5,000.00		
Support of military prison, Fort Leavenworth, Kans	7,110.94			7,110.94	940.81	6,170.13	
Publication of Official Records of War of the Rebellion	14,527.27	145,000.00		159,527.27	95,344.89	11.12	64,171.26
Expenses of military convicts	4,073.25	500.00		4,573.25	256.45	1,629.57	2,687.23
State or Territorial homes for disabled soldiers and sailors	168,999.27	725,000.00		893,999.27	723,466.81	199.53	170,332.93
Support of National Home for Disabled Volunteer Soldiers	1,309.10		8,787.41	10,096.51		10,096.51	
National Home for Disabled Volunteer Soldiers	348,877.17	2,483,478.75		2,832,355.92	2,330,801.20	276,787.56	224,767.16
Support of Soldiers' Home	2,718,432.52	334,660.39		3,053,092.91	312,642.33		2,740,450.58
Tents for sufferers from floods in the Mississippi River		7,837.97		7,837.97	7,837.97		
Arms and quartermasters stores for State of Wyoming	5,666.64			5,666.64			5,666.64
Military stores for Montana militia	11,792.29			11,792.29			11,792.29
Expenses California Débris Commission		15,000.00		15,000.00	8,017.80		6,982.20
Investigating the mining débris question in California	3,766.01			3,766.01			3,766.01
Establishment of Apache prisoners upon military reservation		7,500.00		7,500.00	7,500.00		
Deportation of Refugee Canadian Cree Indians		5,000.00		5,000.00	5,000.00		
Post-office, Fortress Monroe, Va		15,000.00		15,000.00			15,000.00
Establishing Branch National Home for Disabled Volunteer Soldiers, Danville, Ill		150,000.00		150,000.00			150,000.00
Estimate for memorial bridge across Potomac River		2,500.00		2,500.00			2,500.00
Total miscellaneous	3,804,897.90	4,297,977.11	9,546.23	8,112,421.24	3,998,805.52	294,894.42	3,818,721.30
Repayments in excess of payments					9,546.23		
Actual expenditures					3,989,259.29		
War claims of States.							
Examination of claims of States and Territories under act of June 27, 1882	5,689.75			5,689.75			5,689.75
Reimbursing State and citizens of California for expenses in suppressing Modoc Indian hostilities	224.25			224.25			224.25
Total war claims of States	5,914.00			5,914.00			5,914.00

Statement of appropriations under direction of the War Department for the fiscal year ending June 30, 1897, etc.—Continued.

Title of appropriation.	Balance July 1, 1896.	Appropriated July 1, 1896, to June 30, 1897.	Repayments July 1, 1896, to June 30, 1897.	Aggregate available.	Payments July 1, 1896, to June 30, 1897.	Carried to surplus fund June 30, 1897.	Balance June 30, 1897.
MISCELLANEOUS OBJECTS—continued.							
War claims of volunteers.							
Bounty to volunteers, their widows and legal heirs	$56,787.81	$190,000.00		$246,787.81	$158,079.43	$1,838.91	$86,869.47
Bounty to Fifteenth and Sixteenth Missouri Cavalry Volunteers		66.66		66.66	66.66		
Bounty under act of July 28, 1866	2,097.45	22,000.00		24,097.45	21,103.55	896.45	2,097.45
Pay of two and three year volunteers	9,683.47	300,000.00		309,683.47	301,417.08	2,575.35	5,691.04
Services and supplies of Montana volunteers in the Nez Perce Indian war	657.00			657.00			657.00
Three month's pay proper		2,191.10		2,191.10	2,191.10		
Horses and other property lost in the military service	37,950.60			37,950.60	32,083.29	200.00	5,667.31
Commutation of rations to prisoners of war in rebel States and to soldiers on furlough	19,005.61	4,000.00		23,005.61	2,718.79	10,170.85	10,115.97
Traveling expenses, California and Nevada volunteers	187.21			187.21			187.21
Extra pay to officers and men who served in the Mexican war		980.00		980.00	980.00		
Capture of Jefferson Davis	1,503.38			1,503.38			1,503.38
Total war claims of volunteers	127,872.53	519,237.76		647,110.29	518,639.90	15,681.56	112,788.83
Relief acts.							
Claims of officers and men of the Army for destruction of private property		14,781.96		14,781.96	14,781.96		
Claims of loyal citizens for supplies furnished during the rebellion	6,939.00			6,939.00			6,939.00
Claims for quartermaster's stores and commissary supplies, act July 4, 1864	1,048.74			1,048.74			1,048.74
Awards for quartermaster's stores and commissary supplies taken by Army in Tennessee	130.00			130.00			130.00
Payments on account of the Ford Theater disaster	14,440.00			14,440.00	13,890.00		550.00
Reimbursement to Col. F. C. Ainsworth	96.37			96.37		96.37	
Relief of John Finn	6,363.95			6,363.95	5,820.84		543.11
Payment to legal representatives of George Case		475.00		475.00	475.00		
Relief of B. J. Van Vleck, administrator of Henry Van Vleck		8,265.19		8,265.19	8,265.19		
Relief of John A. Lynch		1,666.49		1,666.49	1,666.49		
Relief of Peter Cook		904.00		904.00	904.00		
Relief of Augustus P. Burditt, surviving partner of Burditt & Fisk		5,130.00		5,130.00	5,130.00		
Relief of sufferers from overflow of Mississippi River and its tributaries and Red River of the North		200,000.00		200,000.00	91,314.89		108,685.11
Relief of widow of Thomas L. Young		478.00		478.00	478.00		
Relief of William Gemmill		75.00		75.00	75.00		
Total relief acts	**29,018.06**	**231,775.64**		**260,793.70**	**142,801.37**	**96.37**	**117,896.96**

RECAPITULATION.

Salaries, contingencies, monuments, etc.	$720,490.11	$1,762,281.65	$2,487.18	$2,485,258.94	$1,713,812.36	$95,927.78	$675,518.80
Military Establishment, Army and Military Academy	2,706,000.11	23,867,331.17	61.76	26,573,393.04	22,519,667.77	722,612.05	3,331,118.22
Public works	19,995,918.45	47,304,471.26	3,912.35	67,304,302.06	21,035,393.57	9,713.65	46,259,194.84
Miscellaneous objects	4,029,450.07	5,871,928.51	9,634.48	9,911,013.04	5,484,059.68	323,097.19	4,103,856.17
Total	27,451,858.74	78,806,012.59	16,095.75	106,273,967.08	50,752,933.38	1,151,350.67	54,369,683.03
Repayments in excess of payments					16,095.75		
Actual expenditures					50,736,837.63		

REPORT

OF THE

MAJOR-GENERAL COMMANDING THE ARMY.

ANNUAL REPORT

OF THE

MAJOR-GENERAL COMMANDING THE ARMY.

HEADQUARTERS OF THE ARMY,
Washington, October 21, 1897.

SIR: I have the honor to submit herewith the annual reports of Major-General Merritt, commanding Department of the East; Major-General Brooke, commanding Department of the Missouri; Brigadier-General Otis, commanding Department of the Colorado; Brigadier-General Coppinger, commanding Department of the Platte; Brigadier-General Shafter, commanding Department of California; Brigadier-General Wade, commanding Department of Dakota; Brigadier-General Graham, commanding Department of Texas, and Brigadier-General Merriam, commanding Department of the Columbia; also the reports of the Adjutant-General and Inspector-General of the Army, commandant of the Artillery School, Fort Monroe; commandant of the Cavalry and Light Artillery School, Fort Riley, Kans., and the commandant of the Infantry and Cavalry School, Fort Leavenworth, Kans. These reports give the history of the military forces of the different departments, the movements of troops, the important military changes that have occurred during the year, administration and discipline, the results of inspections, the instruction and progress made at the various military schools of practice; also the reports of field operations, practice marches, target practice, etc.

During the last year there has been, with one exception, a complete change in the stations of the Department commanders.

The Army, although inadequate in point of numbers, was never in a higher state of efficiency, both as to the character and qualifications of its officers and intelligence and loyalty of its soldiers. In the report of Major-General Merritt will be noticed the important changes and improvements that have been made along the Atlantic and Gulf coasts, especially in the mounting of modern artillery and the appliances adopted for the defense of the coasts. In this report Major-General Merritt calls special attention to the report of Colonel Rodgers, inspector of artillery of the department, also to the report of the chief ord-

nance officer of the department, and in their recommendations concerning the increased efficiency of the artillery service, and especially that the artillery soldiers who qualify as gunners and gunnery specialists shall receive proper compensation, I fully concur.

I also concur in the recommendations of Major-General Brooke concerning the necessity for gymnasiums and drill halls, required especially along the line of northern military posts to enable the commands to be properly instructed and exercised during inclement weather or during the winter season; also in his recommendation concerning general service clerks.

The progress that has been made on the Pacific Coast in the establishment of modern batteries of artillery has made it necessary to occupy new ground and to adopt a new system of defense. The very commanding position known formerly as Lime Point has received a portion of its armament, and will soon become a most formidable part of the defense of the harbor of San Francisco. The name of Lime Point has been changed to "Fort Baker," in honor of the distinguished statesman and hero of two wars, Col. Edward Dickinson Baker, who was killed at Balls Bluff, Va., October 21, 1861. It will be noticed by General Shafter's report that very active and earnest work is being done in putting that important harbor in condition of proper defense. The same work is in progress along the Pacific Coast, especially at San Diego, Cal.; and will in time be completed at the mouth of Columbia River, Oregon, and also the entrance to Puget Sound, Washington.

Attention is also invited to the report of General Merriam, commanding Department of the Columbia, especially to the importance of a larger garrison at the entrance of the Columbia River, Oregon, and to his report on the condition and necessities of the great Territory of Alaska.

Alaska is in extent eleven times the area of the State of New York. The recent discovery of rich gold fields, together with valuable silver and copper mines, the timber and fishery interests of that Territory, are attracting and will attract a very large population to that region, necessitating a more stable civil government, and also the occupation of important points by military and by naval forces. As all the other Territories have been occupied by military posts, and appropriations have been made for military roads, establishment of telegraph lines, bridging of rivers, and, in fact, aiding and blocking out the way for occupation of the vast territories by citizens, it is deemed but just and advisable that the same liberal spirit should be manifested toward that great and important Territory.

As far as practicable it would, in my opinion, be advisable to have its waters thoroughly examined by such of the naval forces as could be used for that purpose, and as military reconnoitering and exploring parties in past years have been sent into that country to furnish knowledge of its character, resources, and necessities, this, in my judgment,

should be continued on a larger and more liberal scale. While there is now no conflict between the population, composed of some 20,000 Indians and the white explorers and settlers, as the former are supplied with modern arms they may become turbulent and troublesome. Such has been the history of nearly all the tribes in other Territories. Hence, it would be but reasonable to anticipate the necessities for military forces in that Territory by the establishment of at least three military posts to support the civil authorities, to give protection to the white settlers, and to aid in maintaining law and order in that remote part of our country.

In the report of General Otis it will be observed that during the year there has been conflict with the authorities and disturbance of the peace by the Indians scattered through that portion of the Rocky Mountain region, but, by judicious management and prompt action of the civil authorities and military forces, serious disturbances of the peace have been avoided.

The report of General Coppinger is very complete and quite important, especially concerning the instruction of troops, practice marches, and practical instruction in minor tactics. His views concerning the inspection system of the Army are also worthy of notice.

The condition of the Indians is better to-day than it has been for many years, and during the last year there has been no serious disturbance of the peace. The Indians are making rapid progress toward permanent settlements and semicivilization. It was a wise provision of Congress that authorized the President to detail experienced officers of the Army to act as Indian agents, and I trust this system will be continued. The number of Indian children that are now receiving the advantages of school education is very large, and it is having a very excellent effect upon the condition of the tribes as well as upon their progress as a pastoral and an agricultural people. Their condition is being benefited in many ways.

During the last ten years much attention has been given by the Government to the subject of coast defenses, and most beneficial results are now becoming apparent. Approximately, $26,000,000 have been appropriated by the Government, which is nearly one-third of what is required to put the country in a safe condition of defense. This has been expended in the construction of modern fortifications and high-power guns of great force and magnitude. These weapons of defense are entirely different from what was known to the world a generation ago. A modern gun, with its carriage, emplacement, and ammunition costs on an average $100,000. To properly preserve, keep in working order, and man them in time of hostility requires a most expert and skillful knowledge on the part of both officers and soldiers in the artillery service. Although the general desire of our people is to maintain a condition of peace with all nations, and the policy of the Government is one of good will and peaceful relations with all others, yet nothing could be more injudicious than to remain in a condition of insecurity

and permit the lives of millions and the accumulated wealth of many generations to be destroyed or endangered by any foreign power with which we are liable to come into contact, and the general plan for defense which has been adopted by the Government should be steadily pursued until the nation is in a condition of security and safety which a due regard to self-preservation would demand. I therefore recommend that in the appropriations for the coming fiscal year the following sums be appropriated for the work which is required under the Engineer, Ordnance, and Quartermaster departments: For the purchase of land needed for fortifications—construction of platforms, emplacements, and fortifications; construction of modern high-power guns, mortars, ammunition, gun and mortar carriages, and buildings, quarters, and barracks for troops:

For the mouth of Penobscot River, $175,000; mouth of the Kennebec River, Maine, $198,500; Portland, Me., $1,173,000; Portsmouth, N. H., $377,000; Boston Harbor, $1,347,000; New Bedford, Mass., $204,000; Narragansett Bay, $833,000; defenses of Long Island Sound, $1,070,000; eastern entrance New York, $489,000; southern entrance New York, $1,419,000; approaches to Philadelphia, $441,000; approaches to Baltimore, $499,000; approaches to Washington, D. C., $604,000; Hampton Roads, $463,000; approaches to Wilmington, N. C., $397,000; Charleston Harbor, S. C., $150,000; approaches to Savannah, Ga., $415,000; Key West, Fla., $50,000; Pensacola Harbor, $32,000; approaches to Mobile, Ala., $397,000; approaches to New Orleans, $319,000; Galveston, Tex., $412,000; San Diego, Cal., $725,000; San Francisco, Cal., $1,336,000; Columbia River, $605,000; Puget Sound, $1,140,000; Lake Champlain, $48,000.

It is impossible to anticipate the exact cost of every foot of concrete, every ton of steel, or every yard of masonry required for the construction of fortifications, guns, carriages and ammunition, and military buildings. I therefore earnestly recommend that in the appropriations that are to be made authority be granted by Congress to the Secretary of War to expend the sums appropriated, as far as practicable, according to the plans submitted or make such changes as in his judgment are absolutely required by the necessities of the Government during the fiscal year, in order that the different branches of the Government may work in harmony and the work be completed as rapidly as possible, instead of some portions being in excess and others wholly inadequate, as has been the result in some cases in past years.

The necessity for an army is twofold—one to avoid foreign and domestic wars; the other to restore peace with the least possible delay and sacrifice of life and property when war occurs. When such a misfortune comes in the history of a nation the purpose of an army is to maintain peace, or restore it with the least possible delay; hence, the Army should be adequate to the growth, development, and necessities of a nation.

The great work that has been going on for the last ten years of placing the 4,000 miles of Atlantic, Gulf, and Pacific coasts in proper condition of defense, and upon which the Government has already expended some $26,000,000, is progressing as rapidly as practicable, and already mortar batteries and high-power guns have been placed in positions requiring the constant care and protection of skilled artillerists. By the 31st of December next the following positions will be armed in part or fully with modern appliances of war, and in these important positions there are no troops stationed and none available for assignment to those positions without taking them from other stations where they are at present imperatively required, viz: Portland Head, Portland, Me.; Great Diamond Island, Portland, Me.; Fort Constitution, Portsmouth, N. H.; Grovers Cliff, Boston Harbor, Mass.; Paddocks Island, Boston Harbor, Mass.; Long Island Head, Boston Harbor, Mass.; Dutch Island, Narragansett Bay, R. I.; Great Gull Island, eastern entrance Long Island Sound, N. Y.; Plum Island, eastern entrance Long Island Sound, N. Y.; Fort Hancock, New York Harbor; Finns Point, approach to Philadelphia; North Point, approach to Baltimore; Hawkins Point, approach to Baltimore; Sheridan Point, approach to Washington, D. C.; Fort Caswell, Wilmington, N. C.; Fort Sumter, Charleston, S. C.; Tybee Island, Savannah, Ga.; Fort Morgan, Mobile, Ala.; Fort St. Philip, New Orleans; Fort Point, Galveston, Tex.; Ballast Point, San Diego, Cal.; Fort Baker, San Francisco Harbor, Cal.; Fort Stevens, mouth of Columbia River, Wash.

Several of the places above mentioned have been unoccupied for many years, and many have never been occupied, but the present new system of defense renders their occupation by troops an immediate necessity. The five regiments of artillery are entirely inadequate to man the batteries that the Government has authorized to be placed in positions for the defense of the coast, and at least two additional regiments of artillery are required for immediate duty in this service. I therefore earnestly recommend that Congress authorize an addition of two regiments to the artillery arm of the service. The artillery regiments have heretofore been defectively organized in having two first lieutenants to each battery—in my judgment an unnecessary expense and an obstruction to proper promotion. I therefore recommend that the artillery arm be increased and organized into seven regiments of artillery in accordance with the recommendation made in my last annual report, approved by the former Secretary of War, and introduced in a bill presented to the last Senate by the Hon. Joseph Hawley, Senator from Connecticut, Chairman of the Military Committee of the Senate.

The demand for the services of the infantry are constantly increasing, so that that branch of the service is inadequate for the requirements of the Government, and in addition to this the great Territory of Alaska, that it is now necessary to occupy with suitable garrisons, makes a

demand for additional infantry imperative, and I recommend that Congress authorize the addition of five regiments to that arm of the service.

In 1866 the Army was organized with 54,000 men; and that, in the judgment of the best military minds and most eminent statesmen of that day, was the minimum force which this nation should maintain. Owing to the fact that the Government was burdened with an unusual and enormous debt, and the depressed financial condition of the country at that time, caused a reduction to be made from 54,000 to 45,000, and then later to 30,000, and finally to 25,000 men, and this standard has remained so long that the impression has become crystallized that such a number is sufficient for any and all conditions of the country. The number has no significance whatever as to the requirements and necessities of the Government. In my opinion, it would be wise and judicious for Congress to establish a standard limiting the recruiting of the Army for all future time, unless the conditions of the country should be other than what can now be anticipated. The nation is developing in most unusual and extraordinary proportions—in wealth and population—and as the Army is one of the pillars of the Republic it is proper that it should grow as the nation grows, commensurate with the needs and requirements of the latter, and I therefore recommend that a standard be fixed and authorized by which the strength of the Army should be regulated in time of peace in proportion to the population and wealth of the nation, and that the maximum of enlisted men be limited to one soldier to every 1,000 population, and the minimum, one soldier to every 2,000 population, the number actually in service within this limit to be determined by the President, according to the necessities and requirements of the Government. If such a policy is adopted it would, in my judgment, put our Government on a safe basis, and while we should neither maintain a great standing army that would be a burden or a menace to our people and institutions, neither should we become a nation of noncombatants, and neglect to take the proper precautions that due regard to safety and self-preservation demands. By adopting such a course we would be following the wise injunctions of the first Commander in Chief and President, Washington, not only in maintaining a suitable military force to support the civil government and protect the Republic, but at the same time we would adopt such a system that if properly administered could in time be commended to the people of other countries.

I again renew the recommendations I have made concerning the granting of commissions and discharge to meritorious noncommissioned officers after five years' service who shall successfully pass the required examination, as an encouragement and just recognition of their merit and services.

The personnel of the Army, as before stated, is in most excellent condition and is constantly improving. That there is room for much

improvement in the war material I am equally confident, both in arms, equipment, uniform, and transportation, and such improvements would, in my opinion, promote the efficiency of the service. These, however, are matters of detail, requiring executive action rather than legislative, and will be made the subject of special reports in due time.

The record of the Army for the past one hundred years has been a record of heroic deeds and honorable service. It is at present and will in the future be entitled to the highest regard and generous support of our Government and people.

Very respectfully, your obedient servant,

NELSON A. MILES,
Major-General, Commanding.

Hon. RUSSELL A. ALGER,
Secretary of War.

REPORTS

TO THE

MAJOR-GENERAL COMMANDING THE ARMY.

REPORT OF THE ADJUTANT-GENERAL.

HEADQUARTERS OF THE ARMY,
ADJUTANT-GENERAL'S OFFICE,
Washington, October 19, 1897.

SIR: I have the honor to submit the annual returns of the Army:

A.—Showing the actual strength of the Army, June 30, 1897.

B.—Showing position and distribution of the troops, by departments, taken from the latest returns on file in the Adjutant-General's Office.

C.—Geographical departments and posts, with distribution of troops, post-offices, telegraph stations, and nearest railroad stations and boat landings.

D.—Statement showing gain and loss in the enlisted strength of the Army during the fiscal year ended June 30, 1897.

The number of enlisted men in service June 30, 1897, receiving increased pay under the act of Congress of August 4, 1854, was as follows:

Five years' continuous service ($2 per month)	3,978
Ten years' continuous service ($3 per month)	2,207
Fifteen years' continuous service ($4 per month)	1,137
Twenty years' continuous service ($5 per month)	731
Twenty-five years' continuous service ($6 per month)	414
Thirty years' continuous service ($7 per month)	51
Thirty-five years' continuous service ($8 per month)	4
Total	8,522

DETACHED SERVICE OF OFFICERS.

The detached service of officers for duties at schools and colleges, with the militia, and other duty separating them from service with the Army makes a heavy draft on the effective strength of its officers, being in addition to details for the service necessary for the Army, details at the Military Academy, the service schools, recruiting service, etc., and it is believed has reached a maximum which can not be exceeded without very serious damage to the service. The artillery especially suffers much from the absence of so many of its officers; the first lieutenants of artillery, whose long service in that grade has given them a natural feeling of discouragement at their prospects, frequently seek such details at the colleges to assist in the education of their children, which their small pay and advancing years make a heavy tax on this highly meritorious class of officers. These officers are much sought after for duty at the Military Academy, etc. The result is that the artillery is much embarrassed by the absence of its officers, who are specially needed at this time when the new armament is being supplied and new defensive batteries are being occupied. For the foregoing

reasons I recommend that the number of officers detailed to schools and colleges be not increased, as is frequently proposed.

LAND FOR MINOR TACTICAL EXERCISES AND RIFLE RANGES.

Grounds for minor tactical exercises and rifle ranges, which your orders now require, are needed for all permanent cavalry and infantry posts. A number have heretofore been provided, but Columbus Barracks, Fort Sam Houston, Washington Barracks, and Fort Myer especially need such provision for instruction. It is recommended that they be provided. Also, that at least one tract of ample size be provided in the West, say near Columbus Barracks, Ohio, where the militia of several States can join with the Army for instruction in field duties and exercises, and that provision be made by law for the command and service of such a camp and of calling the militia to it. The advantage of this to the country is too evident to need more than mention to be appreciated.

INCREASE OF THE ARTILLERY AND INFANTRY.

A bill to reorganize the line of the Army, etc., increasing the artillery by two regiments and each infantry regiment by two companies, was introduced in Congress during the first session of the Fifty-fourth Congress (S. 2202 and H. 5835) and favorably reported by the Senate Committee on Military Affairs, its title changed to "A bill to provide a mordern organization for the line of the Army." I have been informed that it was also favorably considered by the military committee of the House of Representatives. It is still pending before Congress and has heretofore been strongly recommended by the Commanding General of the Army and by the Secretary of War. It is an absolutely necessary provision for the preservation, care, and use of our seacoast armament, and as an indispensable preparation to meet emergencies of the country's service as they arise, as they are certain to do. I recommend that the passage of this bill be urged upon Congress.

ENLISTED MEN.

Under the provisions of the law of September 27, 1890, dishonorable discharge was fixed as the penalty to be awarded by a general court-martial on conviction of an offense cognizable only by a general court, when proof was adduced of five or more previous convictions within two years.

The act of Congress, approved July 27, 1892, declared fraudulent enlistment a military offense, punishable by court-martial under the sixty-second article of war.

These two laws, together with perfected methods of detecting fraudulent enlistment of old offenders, and the great care exercised in making enlistments, have proved powerful factors in improving the morale and discipline of the men. The number of dishonorable discharges for fraudulent enlistment, which was 394 in 1892, has steadily decreased, and while it was 84 for the year ended September 1, 1896, it was reduced to 41 during the past year.

June 16, 1890, Congress passed a law authorizing the discharge of men at the expiration of a three months' furlough granted, on application, to men who had served faithfully for three years, the furlough so dated as to expire at the end of the third month after three years' service. This measure, intended to relieve the ranks from men who had become discontented by reason of lack of taste for military service or of an adaptation to its requirements, proved beneficial but costly, and, August 1, 1894, a law was passed fixing the term of enlistment at three

years. The number of men availing themselves of the benefit of the act of June 16, 1890, has increased steadily, but the number (2,895) discharged in 1896, indicated the high-water mark of that cause of loss to the Army. During the past year the number of discharges was 2,603. After November 1, 1897, however, no more discharges can be claimed under the provisions of the law of 1890. Since the passage of that law 13,375 men have been released from their obligations of military service under it.

The character and efficiency of the enlisted men of the Army has never been higher than at the present time. The short term of service and liberal discharge, by purchase or order, of men who find themselves, or are found, unsuited to the service, has eliminated from the Army most of those who are a disadvantageous element. Rifle practice, physical training, exercises in minor tactics, athletic sports, and careful instructions in appropriate military subjects, with a judicious and humane discipline in which the Commanding General of the Army has had the hearty cooperation of commanding generals and of the officers under them, coupled with a careful and judicious recruiting service conducted under my predecessor, Brigadier-General Ruggles, have placed in the Army at this time enlisted men of good character and intelligence, fine physical development, and highly efficient. It is a pleasure to record that when they have been brought in immediate contact with civilians at the various militia camps of instruction, expositions, on practice marches, etc., the officials and the press speak warmly in their praise.

DESERTIONS.

It is gratifying to report that the number of desertions from the Army during the past year has been lower than at any period during the last decade. While this serious military crime will perhaps never be entirely eradicated, yet the adoption of measures tending to guard the service against men of bad character, to increase the well-being, moral and physical, of the American soldier, together with the generally superior class of men now attracted to the ranks bid fair to relieve the Army from the unmerited odium cast upon it in the past by desertions.

POST EXCHANGES.

The post exchange continues to fulfill in a satisfactory manner the purposes for which it was created. Devised eight years ago as a substitute for the post trader's store, whose discontinuance had been decided upon, it has developed into a very useful auxiliary to Army administration as an aid to discipline, contentment, and good conduct in the Army; nearly every commanding officer bears testimony to its value. Originally modeled after the plan of canteens in European armies, with beverages as a prominent feature, it has progressively minimized this feature and established a position that is peculiarly its own, in supplying the wants of the soldier, not met by Government supplies, at prices very little above the cost, the net profits being used for the improvement of his table fare, reading and recreation rooms, gymnasia, etc. The capital with which these establishments are organized and conducted, the equipment, and in several cases the building in which they are located, are virtually the property of the soldiers themselves, and the net profits derived from the business are thus returned to them through the company funds which are expended for their benefit. Beyond the time of an officer to superintend the business and the services of a few enlisted men as attendants at some posts, these exchanges are conducted without expense to the Government, which also has no pecuniary responsibility for the business.

During the year ended June 30, 1897, the aggregate receipts of the 75 exchanges in operation in the Army amounted to $1,606,485.71; there was on hand, in cash, on the 30th of June, 1896, $54,977.43, and there was received as money on deposit, $154,184.68, making the total amount of money received, $1,815,647.82. There was expended for merchandise purchased, rent, fixtures and repairs, and expenses of operation, $1,267,104.47, which, less deposits, gave net profit of $394,358.67. From this amount there was donated to the funds of the several regimental bands, $8,621.91; to the maintenance of post gardens, $4,575.94; as prizes for the encouragement of athletic sports, $5,158.24; and, after setting aside the sum of $117,739.08 as a reserve fund to meet anticipated expenses for at least one month, there was returned to the members in the form of dividends the sum of $255,164.01.

The net value of these exchanges, that is to say, the balance of their combined assets over their liabilities, was, on June 30, 1897, $259,147.28.

In the experimental stage it was necessary that the stewards and attendants should be enlisted men, and at isolated posts, where it is impracticable to find competent civilians, and at a few small ones, where the business will not justify their employment, the practice still obtains. The number of enlisted men thus employed has been reduced, however, nearly 15 per cent during the past year, and the number of civilians correspondingly increased. The exchanges now employ 169 civilians, at a monthly compensation of $6,192.

POST-GRADUATE SCHOOLS.

The reports from the several post-graduate schools, viz, the Artillery School at Fort Monroe, Va., the Infantry and Cavalry School at Leavenworth, Kans., the Cavalry and Light Artillery School at Fort Riley, Kans., evidence efficiency on the part of officers of the schools, and the maintenance of the excellent and thorough methods of instruction that have characterized those schools in the past show, in general, industry, zeal, and creditable proficiency on the part of the students. They are of very great benefit to the service.

The rearrangement of the course at the Infantry and Cavalry School during the last session and the reduction in the number of instructors there was in the line of improvement. If the students at the Artillery School and the Infantry and Cavalry School were arranged into two classes, one class entering every year, the number of officers employed as instructors could be further reduced and other manifest advantages could be obtained.

LYCEUMS.

The reports from the department commanders indicate that the prescribed courses have been outlined with care and judgment, being both scientific and practical, and the range of essays read evidence a high average of military culture and intelligence. It is noted that the discussions of actual campaigns, and the study of the principles of minor tactics by means of imagined conditions illustrated by map representations, have awakened great general interest, and that the last-named feature, which has largely superseded the old recitation plan, has supplied a new and effective incentive to military study and research, and has relieved lyceum sessions of much of the monotony attending mere recitations. Lack of military maps has been found a great drawback to accuracy of statement and thorough analysis.

The lyceum, having outgrown its original purpose of "preparing officers for examination for promotion," its purpose was modified during the last summer season, on your recommendation, to "progress in the

knowledge of military affairs," with provisions for a careful supervision of its work, for the examination, publication, and use of its papers, and for a lyceum library, many books for which have already been supplied. It is believed that the new system will now be a decided advance in its usefulness to the Army.

GYMNASIUMS AND PHYSICAL TRAINING.

The troops have generally given much attention to physical training and have shown expertness in the exercises. In the absence of necessary facilities and appurtenances much has been improvised through the determination and ingenuity of the officers interested. Instruction through continual systematic work is, of course, under great disadvantage in posts having a severe winter without the necessary buildings which are still needed at most of such posts. Our experience has already shown that calisthenics, gymnastics, and athletics are an important aid to military training "in mitigating and removing bodily defects, promoting strength, agility, and endurance, as well as in awakening courage, determination, and self-reliance." I quote from the report of General Coppinger. This end being of very great importance to the Government, buildings, when necessary, should be provided, especially at permanent posts.

First Lieut. Edmund L. Butts, Fifth Infantry (formerly of the Twenty-first Infantry), under your orders employed for several years in instructing officers and men at a number of military posts in physical drill, devoted last winter, under your approval, to the preparation of a manual of Physical Drill for the Army, which has been published, and copies purchased and distributed to the service. The preparation of Lieutenant Butts for this work was extended, and he is believed to be an expert in this work. It is confidently believed that this manual will be of very great service in Army physical training.

The records of this department show that in this work you have had the cordial and effective cooperation of the commanding generals of the departments and, generally, of the service, with an increasing appreciation of its value.

POST SCHOOLS.

Section 1231 of the Revised Statutes provides for the establishment at all posts of schools in which enlisted men shall be instructed in the common English branches, especially in the history of the United States, but this provision was made many years ago, and the Army has largely outgrown it.

The educational qualifications now required before enlistment have very much lessened the necessity for post schools as provided for in that act, and the time has arrived for the adoption of a higher plane of instruction that shall bear a more direct relation to the duties of a soldier. It is recommended that in schools for enlisted men, provision be made for instruction in military correspondence, in the making of company and regimental reports, returns, etc., and, when practicable, in shorthand and typewriting, officers to take a more active part in such instruction than heretofore. With such instruction, the usefulness of the men can be much enlarged. The schools for children still show a need of competent teachers, and the building accommodations at certain posts are inadequate.

Respectfully submitted.

SAM'L BRECK,
Adjutant-General.

Maj. Gen. NELSON A. MILES,
Commanding the Army.

B.—*Position and distribution of troops, by departments, taken from*

Posts.	Situations.	Commanding officer.	GARRISONS.		PRESENT.				
			Number of companies.	Regiment.	General officers.	Aides-de-camp.	Adjutant-General's Department.	Bureau of Military Justice.	Quartermaster's Department.
Department of the East.									
Headquarters	Governors Island, N. Y.	Maj. Gen. W. Merritt	...	Department staff.	1	3	1	1	4
Fort Preble, Me	Portland	Capt. R. M. Rogers, 2d Art.	1	2d Art.	--	--	--	--	--
Fort Ethan Allen, Vt.	Near Burlington	Col. G. V. Henry, 10th Cav.	4	3d Cav	--	--	--	--	--
Fort Warren, Mass.	Boston Harbor	Maj. C. A. Woodruff, 2d Art.	2	2d Art	--	--	--	--	--
Fort Adams, R. I.	Newport	Col. A. C. M. Pennington, 2d Art.	4	2d Art	--	--	--	--	--
Fort Trumbull, Conn.	New London	Capt. F. C. Grugan, 2d Art.	1	2d Art	--	--	--	--	--
Fort Columbus, N.Y.	New York Harbor	Lieut. Col. W. S. Worth, 13th Inf.	3	13th Inf	--	--	--	--	--
Fort Hamilton, N. Y.	do	Maj. J. G. Ramsay, 5th Art.	4	5th Art	--	--	--	--	--
Fort Wadsworth, N. Y.	do	Lieut. Col. Wm. Sinclair, 5th Art.	3	5th Art	--	--	--	--	--
Fort Schuyler, N. Y.	Throgs Neck	Lieut. Col. W. L. Haskin, 2d Art.	2	2d Art	--	--	--	--	--
Fort Slocum, N. Y	Near New Rochelle.	Maj. Tully McCrea, 5th Art.	3	5th Art	--	--	--	--	--
Fort Niagara, N. Y	Youngstown	Col. A. T. Smith, 13th Inf.	3	13th Inf	--	--	--	--	--
Fort Porter N. Y	Buffalo	Maj. P. H. Ellis, 13th Inf.	2	13th Inf	--	--	--	--	--
Madison Barracks, N. Y.	Sacket Harbor	Col, W. H. Powell, 9th Inf.	8	9th Inf	--	--	--	--	--
Plattsburg Barracks, N. Y.	Plattsburg	Col. Jacob Kline, 21st Inf.	8	21st Inf	--	--	--	--	--
Fort McHenry, Md	Baltimore	Maj. G. B. Rodney, 4th Art.	3	4th Art	--	--	--	--	--
Fort Washington, Md.	Potomac River	Capt. Walter Howe, 4th Art.	1	4th Art	--	--	--	--	--
Fort Myer, Va	Near Washington, D. C.	Col. S. S. Sumner, 6th Cav.	4	6th Cav	--	--	--	--	1
Fort Monroe, Va		Col. R. T. Frank, 1st Art.	8	1st, 2d, 3d, 4th, and 5th Art.	--	--	--	--	--
Columbus Barracks, Ohio.	Columbus	Col. J. S. Poland, 17th Inf.	8	17th Inf	--	--	--	--	1
Fort Thomas, Ky	Near Newport	Col. M. A. Cochran, 6th Inf.	8	6th Inf	--	--	--	--	--
Fort McPherson, Ga.	Atlanta	Col. H. C. Cook, 5th Inf.	8	5th Inf	--	--	--	--	--
Jackson Barracks, La.	New Orleans	Capt. E. K. Russell, 1st Art.	2	1st Art	--	--	--	--	--
St. Francis Barracks, Fla.	St. Augustine	Lieut. Col. J. B. Rawles, 1st Art.	2	1st Art	--	--	--	--	--
Key West Barracks, Fla.	Key West	Capt. A. Merrill, 1st Art.	2	1st Art	--	--	--	--	--
Fort Barrancas, Fla.	Warrington	Capt. J. W. MacMurray, 1st Art.	2	1st Art	--	--	--	--	--
Washington Barracks, D. C.	Washington	Col. F. L. Guenther, 4th Art.	4	1st and 4th Art.	--	--	--	--	--
Total Department of the East			100		1	3	1	1	6
Department of the Missouri.									
Headquarters	Chicago, Ill	Maj. Gen. J. R. Brooke	...	Department staff.	1	3	1	1	3
Fort Wayne, Mich	Detroit	Col. S. Snyder, 19th Inf.	4	19th Inf	--	--	--	--	--
Fort Brady, Mich.	Sault Ste. Marie	Lieut. Col. C. C. Hood, 19th Inf.	4	19th Inf	--	--	--	--	--
Fort Sheridan, Ill.	Highwood	Col. R. H. Hall, 4th Inf	11	1st Cav., 2d Art., and 4th Inf.	--	--	--	--	--

the latest returns on file in the Adjutant-General's Office, 1897.

PRESENT.																ABSENT.						AGGREGATE.		
Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Colonels.	Lieutenant-colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and regimental staff officers.	Captains.	Subalterns.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.
2	1	4	...	...	...	1	...	...	1	...	...	...	1	.....	20	20	...	...	...	...	...	...	20	.....	20
...	1	...	...	...	...	...	...	...	1	...	...	...	3	63	5	68	...	...	...	...	...	...	5	63	68
...	2	...	...	...	...	1	...	...	4	...	1	1	7	261	16	277	...	...	2	2	4	4	20	261	281
...	1	...	...	...	...	...	...	1	2	...	...	...	5	129	9	138	...	...	...	1	1	1	10	129	139
...	2	...	...	...	...	1	...	...	4	...	1	1	8	286	17	303	...	2	...	4	6	6	23	286	309
...	1	...	...	...	...	...	...	...	1	...	...	...	2	68	4	72	...	...	...	2	2	2	6	68	74
...	2	...	...	...	...	...	1	...	3	...	...	...	6	223	12	235	...	...	...	...	...	...	12	223	235
...	2	...	...	...	...	...	...	1	2	...	1	1	9	284	16	300	...	...	1	3	4	4	20	284	304
...	1	...	...	...	...	...	1	1	3	...	...	...	5	195	11	206	...	...	...	4	4	4	15	195	210
...	1	...	...	...	...	...	1	...	2	...	...	...	4	129	8	137	...	...	...	2	2	2	10	129	139
...	1	...	...	...	...	...	...	1	3	...	...	...	4	183	9	192	...	...	...	5	5	5	14	183	197
...	1	...	...	...	...	1	...	...	4	...	1	1	5	203	13	216	...	...	1	5	6	6	19	203	222
...	1	...	...	...	...	...	...	1	2	...	...	...	4	122	8	130	...	...	...	...	...	...	8	122	130
...	2	...	...	...	...	1	1	...	8	...	1	1	17	512	31	543	...	1	2	4	7	7	38	512	550
...	2	...	...	...	...	1	1	1	9	...	1	1	16	522	32	554	...	...	1	6	7	7	39	522	561
...	1	...	...	...	...	...	...	1	3	...	...	...	6	192	11	203	...	...	...	4	4	4	15	192	207
...	...	...	...	...	...	...	...	...	1	...	...	...	2	67	3	70	...	...	...	2	2	2	5	67	72
...	1	...	...	...	...	1	...	1	6	...	1	1	12	298	24	322	...	1	...	...	1	1	25	298	323
...	2	...	...	...	1	1	1	2	8	...	...	...	30	526	45	571	...	...	...	8	8	8	53	526	579
...	2	...	...	...	...	1	1	...	8	...	1	1	16	556	31	587	...	1	2	5	8	8	39	556	595
...	2	...	...	...	1	1	1	1	8	...	1	1	17	528	33	561	...	...	2	4	6	6	39	528	567
...	2	...	...	...	...	1	...	1	7	...	1	1	18	525	31	556	1	1	3	4	9	9	40	525	565
...	1	...	...	...	...	...	...	...	2	...	...	...	4	131	7	138	...	...	...	3	3	3	10	131	141
...	1	...	...	...	...	...	1	...	2	...	1	1	2	158	8	166	...	...	...	4	4	4	12	158	170
...	1	...	...	...	...	...	...	...	2	...	...	...	3	123	6	129	...	...	...	3	3	3	9	123	132
...	1	...	...	...	...	...	...	...	1	...	...	...	3	127	5	132	1	...	1	3	5	5	10	127	137
...	3	...	...	...	...	1	...	2	4	...	1	1	7	311	19	330	...	...	...	5	5	5	24	311	335
2	38	4	...	...	2	12	9	14	101	...	12	12	216	6,722	434	7,156	2	6	15	83	106	106	540	6,722	7,262
1	2	3	1	...	...	...	...	...	...	...	...	...	...	.....	16	16	...	...	...	...	...	...	16	.....	16
...	2	...	...	...	...	1	...	...	4	...	1	1	8	281	17	298	...	1	2	2	5	5	22	281	303
...	1	...	...	...	...	...	1	...	4	...	...	...	7	255	13	268	...	...	...	1	1	1	14	255	269
...	2	...	...	...	1	1	1	2	11	...	1	1	21	734	41	775	...	...	2	3	5	5	46	734	780

B.—*Position and distribution of troops, by departments, taken from*

Posts.	Situations.	Commanding officer.	GARRISONS.		PRESENT.				
			Number of companies.	Regiment.	General officers.	Aides-de-camp.	Adjutant-General's Department.	Bureau of Military Justice.	Quartermaster's Department.
Department of the Missouri—Cont'd.									
Fort Leavenworth, Kans.	Leavenworth	Col. H. S. Hawkins, 20th Inf.	12	6th Cav. and 20th Inf.	..	..	..	..	1
Fort Riley, Kans	Junction City	Col. A. K. Arnold, 1st Cav.	11	1st and 2d Cav. and 4th and 5th Art.	..	..	..	..	1
Fort Reno, Okla	Near Cheyenne Agency.	Col. E. P. Pearson, 10th Inf.	6	1st Cav. and 10th Inf.	..	..	..	..	..
Fort Sill, Okla	29 miles from Rush Springs.	Lieut. Col. E. R. Kellogg, 10th Inf.	6	1st Cav. and 10th Inf.	..	..	..	..	..
Fort Logan H. Roots, Ark.	Near Little Rock	Capt. J. A. Buchanan, 11th Inf.	2	11th Inf.	..	..	..	..	..
Jefferson Barracks, Mo.	10 miles below St. Louis.	Maj. H. W. Wessells, jr., 3d Cav.	6	3d Cav	..	..	..	..	..
Total Department of the Missouri			62		1	3	1	1	5
Department of Dakota.									
Headquarters	St. Paul, Minn	Brig. Gen. J. F. Wade		Department staff.	1	2	1	..	2
Fort Snelling, Minn	Near St. Paul	Col. J. H. Page, 3d Inf	8	3d Inf	..	..	..	..	..
Fort Yates, N. Dak	60 miles from Bismarck.	Maj. J. N. Wheelan, 8th Cav.	3	8th Cav. and 2d Inf.	..	..	..	..	..
Fort Keogh, Mont	Near Miles City	Col. J. C. Bates, 2d Inf	5	8th Cav. and 2d Inf.	..	..	..	..	..
Fort Custer, Mont		Lieut. Col. A. S. Daggett, 25th Inf.	6	10th Cav. and 25th Inf.	..	..	..	..	..
Fort Assinniboine, Mont.	Assinniboine	Lieut. Col. T. A. Baldwin, 10th Cav.	8	10th Cav. and 25th Inf.	..	..	..	..	..
Fort Harrison, Mont.	Helena	Lieut. Col. W. M. Wherry, 2d Inf.	2	2d Inf	..	..	..	..	..
Fort Missoula, Mont.	Missoula	Col. A. S. Burt, 25th Inf	4	25th Inf	..	..	..	..	..
Fort Yellowstone, Wyo.	Yellowstone Park	Col. S. B. M. Young, 3d Cav.	2	4th Cav	..	..	..	..	..
Total Department of Dakota			38		1	2	1	..	2
Department of the Colorado.									
Headquarters	Denver, Colo	Brig. Gen. E. S. Otis		Department staff.	1	2	1	..	2
Fort Logan, Colo	do	Col. D. W. Benham, 7th Inf.	10	2d Cav. and 7th Inf.	..	..	..	..	..
Fort Du Chesne, Utah.	Uintah Agency	Maj. C. S. Ilsley, 9th Cav.	2	9th Cav	..	..	..	..	..
Fort Douglas, Utah	Salt Lake City	Col. J. F. Kent, 24th Inf	8	24th Inf	..	..	..	..	..
Fort Wingate, N. Mex.	Near Wingate	Col. G. G. Huntt, 2d Cav	2	2d Cav	..	..	..	..	..
Fort Bayard, N. Mex	Halls	Col. E. Moale, 15th Inf	6	7th Cav. and 15th Inf.	..	..	..	..	..
Fort Grant, Ariz	27 miles from Willcox.	Col. E. V. Sumner, 7th Cav.	6	7th Cav. and 15th Inf.	..	..	..	..	..
Fort Apache, Ariz	90 miles from Holbrook.	Lieut. Col. M. Cooney, 7th Cav.	6	7th Cav. and 11th Inf.	..	..	..	..	..
Fort Huachuca, Ariz	Near Huachuca Station.	Maj. H. J. Nowlan, 7th Cav.	6	1st and 7th Cav. and 15th Inf.	..	..	..	..	..
Whipple Barracks, Ariz.	Prescott	Col. I. D. De Russy, 11th Inf.	2	11th Inf	..	..	..	..	..
Total Department of the Colorado			48		1	2	1	..	2

the latest returns on file in the Ajutant-General's Office, 1897—Continued.

PRESENT.																	ABSENT.						AGGREGATE.		
Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Colonels.	Lieutenant-colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and regimental staff officers.	Captains.	Subalterns.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.
...	3	...	...	...	1	1	2	3	17	...	1	1	58	754	88	842	...	...	1	5	6	6	94	754	848
...	3	...	...	...	1	1	1	3	11	...	1	1	26	787	49	836	...	...	2	2	4	4	53	787	840
...	2	...	...	...	1	1	...	1	4	...	1	1	12	388	23	411	...	...	4	5	9	9	32	388	420
...	2	...	...	...	1	...	1	1	6	...	...	...	7	384	18	402	...	...	...	5	5	5	23	384	407
...	1	...	...	...	...	...	...	...	1	...	...	...	4	132	6	138	...	...	1	...	1	1	7	132	139
...	2	...	...	...	...	...	...	2	5	...	...	...	12	383	21	404	...	...	1	...	1	1	22	383	405
1	20	3	1	...	5	5	6	12	65	...	5	5	155	4,098	292	4,390	...	1	13	23	37	[a]37	320	4,098	4,427
1	1	3	1	...	...	...	...	...	1	...	...	...	...	.....	13	13	...	...	...	...	...	...	13	.....	13
...	2	...	...	...	1	1	1	1	8	...	1	1	15	513	31	544	...	...	2	7	9	9	40	513	553
...	1	...	...	...	1	...	...	1	3	...	...	...	3	181	9	190	...	...	...	3	3	3	12	181	193
...	2	...	...	...	1	1	...	1	5	...	1	1	9	326	21	347	...	...	3	6	9	9	30	326	356
...	2	...	...	...	...	...	1	1	5	...	...	...	8	348	17	365	...	...	1	4	5	5	22	348	370
...	2	...	...	...	...	...	1	3	4	1	1	1	17	498	30	528	...	...	6	4	10	10	40	498	538
...	1	...	...	...	1	...	1	...	2	...	...	...	3	131	8	139	...	...	...	1	1	1	9	131	140
...	2	...	...	...	...	1	...	...	3	1	1	1	9	290	18	308	...	...	...	4	4	4	22	290	312
...	1	...	...	...	...	1	...	...	1	...	...	...	4	119	7	126	...	...	1	...	1	1	8	119	127
1	14	3	1	...	4	4	4	7	32	2	4	4	68	2,406	154	2,560	...	...	13	29	42	42	196	2,406	2,602
1	1	3	...	...	...	...	...	...	2	...	...	...	...	.....	13	13	...	...	...	...	...	...	13	.....	13
...	3	...	...	...	1	1	1	1	12	...	1	1	19	639	40	679	...	...	...	6	6	6	46	639	685
...	1	...	...	...	...	...	...	1	1	...	...	...	4	122	7	129	...	...	1	...	1	1	8	122	130
...	2	...	...	...	...	1	1	...	7	1	1	1	16	525	30	555	...	1	4	...	5	5	35	525	560
...	1	...	...	...	...	1	1	1	1	...	1	1	4	146	11	157	...	1	3	4	8	8	19	146	165
...	2	...	...	...	1	1	1	...	4	...	1	1	13	392	24	416	...	...	4	5	9	9	33	392	425
...	3	...	...	...	...	1	...	1	4	...	1	1	11	396	22	418	...	1	4	5	10	10	32	396	428
...	2	...	...	...	1	...	1	1	4	...	...	...	9	318	18	336	...	...	2	3	5	5	23	318	341
...	2	...	...	...	...	...	...	1	3	...	...	...	10	369	16	385	...	...	3	2	5	5	21	369	390
...	2	...	...	...	...	1	...	1	...	...	1	1	5	154	11	165	...	...	4	3	7	7	18	154	172
1	19	3	...	...	3	6	5	7	38	1	6	6	91	3,061	192	3,253	...	3	25	28	56	56	248	3,061	3,309

the latest returns on file in the Adjutant-General's Office, 1897—Continued.

PRESENT.																ABSENT.						AGGREGATE.		
Subsistence Department.	Medical Department.	Pay Department.	Corps of Engineers.	Ordnance Department.	Post chaplains.	Colonels.	Lieutenant-colonels.	Majors.	Captains.	Regimental chaplains.	Regimental adjutants.	Regimental quartermasters.	Subalterns.	Enlisted men.	Total commissioned.	Aggregate.	General and staff officers.	Field and regimental staff officers.	Captains.	Subalterns.	Total commissioned.	Aggregate.	Commissioned officers.	Enlisted men.	Aggregate.
...	1	...	...	...	1	...	...	...	1	...	...	...	2	69	5	74	...	1	...	2	3	3	8	69	77
...	1	...	...	...	1	1	...	1	2	...	1	1	4	138	12	150	1	2	2	4	9	9	20	138	158
...	1	...	...	...	1	...	...	1	1	...	...	...	3	129	7	136	...	...	1	1	2	2	9	129	138
...	1	...	...	...	1	1	...	...	5	...	1	1	9	332	19	351	...	...	2	6	8	8	27	332	359
...	1	...	...	...	...	...	1	...	2	...	...	...	4	114	8	122	...	...	...	...	...	...	8	114	122
1	8	2	...	...	4	3	1	3	19	...	3	3	37	1,357	90	1,447	1	4	9	19	33	33	122	1,357	1,479

C.—Military commands and posts, with post-offices, telegraph stations, and nearest railroad stations or boat landings.

ARMY OF THE UNITED STATES.

Headquarters, Washington, D. C., Maj. Gen. N. A. MILES, commanding.

DEPARTMENT OF THE EAST.

Maj. Gen. WESLEY MERRITT, commanding. Headquarters, Governors Island, New York City.

Geographical limits.—The New England States, States of New York, New Jersey, Pennsylvania, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Louisiana, Mississippi, Alabama, Kentucky, Tennessee, Ohio, and the District of Columbia.

DEPARTMENT OF THE MISSOURI.

Maj. Gen. J. R. BROOKE, commanding. Headquarters, Chicago, Ill.

Geographical limits.—States of Michigan, Wisconsin, Indiana, Illinois, Missouri, Kansas, and Arkansas, Indian and Oklahoma Territories.

DEPARTMENT OF DAKOTA.

Brig. Gen. J. F. WADE, commanding. Headquarters, St. Paul, Minn.

Geographical limits.—States of Minnesota, South Dakota (excepting so much as lies south of the forty-fifth parallel west of the Missouri River, and all south of the forty-fourth parallel east of that river), North Dakota, and Montana, and the post of Fort Yellowstone, Wyo.

DEPARTMENT OF THE COLORADO.

Brig. Gen. E. S. OTIS, commanding. Headquarters, Denver, Colo.

Geographical limits.—States of Colorado and Utah and the Territories of Arizona and New Mexico.

DEPARTMENT OF THE COLUMBIA.

Brig. Gen. H. C. MERRIAM, commanding. Headquarters, Vancouver Barracks, Wash.

Geographical limits.—States of Oregon, Washington, and Idaho, and Alaska Territory, excepting so much of Idaho as is embraced in the Department of the Platte.

DEPARTMENT OF CALIFORNIA.

Brig. Gen. W. R. SHAFTER, commanding. Headquarters, San Francisco, Cal.

Geographical limits.—States of California and Nevada.

DEPARTMENT OF TEXAS.

Brig. Gen. W. M. GRAHAM, commanding. Headquarters, San Antonio, Tex.

Geographical limits.—State of Texas.

DEPARTMENT OF THE PLATTE.

Brig. Gen. JOHN J. COPPINGER, commanding. Headquarters, Omaha, Nebr.

Geographical limits.—States of Iowa, Nebraska, and Wyoming (excepting the post of Fort Yellowstone, Wyo.); so much of Idaho as lies east of a line formed by the extension of the western boundary of Utah to the northeastern boundary of Idaho, and so much of South Dakota as lies south of the forty-fifth parallel west of the Missouri River, and all south of the forty-fourth parallel east of that river.

POSTS.

[Those not garrisoned are indicated thus *.]

Adams, Fort, R. I. (Dept. East).—P. O., R. R. and tel. stn. Newport, R. I.; boat from Newport, dist. 1½ m.

Alcatraz Island, Cal. (Dept. Cal.).—P. O. same; tel. and R. R. stn. San Francisco, Cal., dist. 4 m.; Govt. steamer daily (except Sunday) to post.

Angel Island, Cal. (Dept. Cal.).—P. O. and tel. stn. same; R. R. stn. San Francisco, Cal., dist. 7 m.; Govt. steamer daily (except Sunday) to post.

Apache Fort, Ariz. (Dept. Colo.).—P. O. and tel. stn. same; stage daily from Holbrook, on A. and P. R. R., dist. 90 m.

Army and Navy General Hospital, Ark.—P. O., tel. and R. R. stn. Hot Springs, Ark.

Assiniboine, Fort, Mont. (Dept. Dak.).—P. O. same; tel. and R. R. stn. (G. N. R.) Assiniboine, Mont., dist. 1¾ m.

Baker, Fort, Cal. (Dept. Cal.).—P. O., tel. and R. R. stn. Sausalito, Cal., dist. 2 m.; ferryboat from San Francisco to Sausalito, dist. 6 m.

Barrancas, Fort, Fla. (Dept. East).—P. O. Warrington, Fla.; tel. stn. Pensacola Navy-Yard, Fla.; R. R. stn. at post.

Bayard, Fort, N. Mex. (Dept. Colo.).—P. O., tel. and R. R. stn. (S. C. and N. R. R.) same.

Benicia Barracks, Cal. (Dept. Cal.).—P. O., tel. stn., R. R. stn. and boat landing Benicia, Cal., dist. 1 m.

Bliss, Fort, Tex. (Dept. Tex.).—P. O. and R. R. stn. El Paso, Tex., dist. 6 m.; tel. stn. at post.

Boise Barracks, Idaho (Dept. Columbia).—P. O., tel. and R. R. stn. Boise, Idaho.

Brady, Fort, Mich. (Dept. Mo.).—P. O., tel. and R. R. stn. Sault Ste. Marie, Mich., dist. 1 m.

Brown, Fort, Tex. (Dept. Tex.).—P. O., tel. and R. R. stn. (R. G. R. R.) Brownsville, Tex.

Canby, Fort, Wash. (Dept. Columbia).—P. O. and tel. stn. at post; daily steamer from Portland, Oreg., to Astoria, dist. 98 m., and thence by steam tug daily (except Sunday) to post, dist. 14 m.

**Carroll, Fort, Md.*—P. O. and tel. stn. Baltimore, Md., dist. 6½ m. by water from Light. st. wharf.

**Caswell, Fort, N. C.*—P. O. and tel. stn. Southport, N. C., dist. 2 m.; steamer daily from Wilmington to Southport, dist. 22 m.

Chickamauga and Chattanooga National Park (Camp Alger), *Ga.* (East).—P. O. and R. R. stn. Lytle, Ga.; dist. ½ m.; tel. stn. Chickamauga, Ga.

Clark, Fort, Tex. (Dept. Tex.).—P. O. Brackettville, Tex.; tel. stn. Fort Clark, via Spofford Junction, Tex.; daily stage from Spofford Junction, on S. P. R. R.; dist. 9 m.

**Clarks Point, Mass., Fort at.*—P. O. and tel. stn. New Bedford, Mass., dist. 4 m.

**Clinch, Fort, Fla.*—P. O., tel. and R. R. stn. Fernandina, Fla., dist. 3 m.

Columbus Barracks, Ohio (Dept. East).—P. O. and R. R. stn. Columbus, Ohio; tel. stn. at post.

Columbus, Fort, N. Y. (Dept. East).—P. O. and tel. stn. Governors Island, N. Y. City; Govt. steamer to post.

**Constitution, Fort, N. H.*—P. O. Newcastle, N. H.; tel. and R. R. stn. Portsmouth, N. H.; stage or steamer from Portsmouth, dist. 3 m.

Crook, Fort, Nebr. (Dept. Platte) (10 miles south of Omaha).—P. O., tel. and R. R. stn. same.

Custer, Fort, Mont. (Dept. Dak.).—P. O., tel. and R. R. stn. same.

D. A. Russell, Fort, Wyo. (Dept. Platte).—P. O., tel. and R. R. stn. (U. P., D. and G.) Fort Russell, Wyo.

**Delaware, Fort, Del.*—P. O. and tel. stn. Delaware City, Del.; daily steamer from Philadelphia to Delaware City, dist. 2 m. from post.

Douglas, Fort, Utah (Dept. Colo.).—P. O. same; tel. and R. R. stn. Salt Lake City, Utah, dist. 3 m.; city railway to post.

Du Chesne, Fort, Utah (Dept. Colo.).—P. O. and tel. stn. same; R. R. stn. (R. G. W. R. R.) Price, Utah; dist. 90 m.; stage line to post daily.

**Dutch Island, R. I., Fort on.*—P. O. Jamestown, R. I.; tel. stn. Newport, R. I.; steam ferry from Newport to Jamestown, dist. 4 m., and private boat thence to post, dist. 1 m.

Eagle Pass, Camp (subpost of Fort Clark, Tex.) (Dept. Tex.).—P. O., tel. and R. R. stn. Eagle Pass, Tex.

Ethan Allen, Fort, Vt. (Dept. East).—P. O. and R. R. stn. Essex Junction, Vt., dist. 2 m.; tel. stn. Burlington, Vt., dist. 5 m.

**Finns Point, N. J., Battery at.*—P. O., R. R. and tel. stn. Salem, N. J., dist. 6 m.

**Foote, Fort, Md.*—P. O. New Glatz, Md.; tel. stn. Alexandria, Va.; steamer from Washington, D. C., dist. 9 m.

**Gaines, Fort, Ala.*—P. O., tel. and R. R. stn. Mobile, Ala., boat from Mobile, dist. 30 m.
**Gorges, Fort, Me.*—P. O., R. R. and tel. stn. Portland, Me., dist. 3 m.
Grant, Fort, Ariz. (Dept. Colo.).—P. O. and tel. stn. same; daily stage (except Sunday) from Wilcox, on S. P. R. R., dist. 27 m.
**Griswold, Fort, Conn.*—P. O. Groton, Conn.; tel. and R. R. stn. New London, Conn.; ferry from New London, dist. 1 m.
Hamilton, Fort, N. Y. (Dept. East).—P. O. and tel. stn. same; city railroad from Brooklyn, dist. 6 m.
Hancock, Fort, New York Harbor. (Dept. East).—P. O. Governors Island, New York City, tel. stn. Sandy Hook, N. J.; Govt. steamer daily from New York City, dist. 20 m.
Harrison, Fort, Mont. (Dept. Dak.).—P. O., tel. and R. R. stn. Helena, Mont., dist. 4 m.
Huachuca, Fort, Ariz. (Dept. Colo.).—P. O. and tel. stn. same; daily buckboard from Huachuca Siding on N. Mex. and A. R. R., dist. 7 m.
**Independence, Fort, Mass.*—P. O. and tel. stn. Boston, Mass.; Govt. tug from Boston, dist. 3 m.
Jackson Barracks, La. (Dept. East).—P. O. and R. R. stn. New Orleans, La., dist. 6 m.; street cars from New Orleans pass the post; tel. stn. Slaughter House, St. Bernard Parish, La.
**Jackson, Fort, La.*—P. O. and R. R. stn. Buras, La., dist. 5 m.; tel. stn. Quarantine, La.
Jefferson Barracks, Mo. (Dept. Mo.).—P. O., tel. and R. R. stn. same.
**Jefferson, Fort, Fla.*—P. O. and tel. stn. Key West, Fla.; boat from Key West, dist. 71 m.
**Johnston, Fort, N. C.*—P. O. and tel. stn. Southport, N. C.; steamer daily from Wilmington, N. C., dist. 25 m.
Keogh, Fort, Mont. (Dept. Dak.).—P. O., tel. and R. R. stn. (N. P. R. R.) same.
Key West Barracks, Fla. (Dept. East).—P. O., tel. stn. and boat ldg. Key West, Fla.
**Knox, Fort, Me.*—P. O. Prospect Ferry, Me.; tel. and R. R. stn. Bucksport, Me.; ferry from Bucksport, dist. ¼ m.
**Lafayette, Fort, N. Y. H.*—P. O. and tel. stn. Fort Hamilton, N. Y.; city railroad from Brooklyn, dist. 6 m.
Leavenworth, Fort, Kans. (Dept. Mo.).—P. O., tel. and R. R. stn. same.
**Livingston, Fort, La.*—P. O. Grand Isle, La.; tel. stn. New Orleans, La.; steamer weekly from New Orleans, dist. 95 m.
Logan, Fort, Colo. (10 miles south of Denver) (Dept. Colo.).—P. O., tel. and R. R. stn. (D. and R. G. and U. P. R. R.) same.
Logan H. Roots, Fort, Ark. (Dept. Mo.).—P. O. Baring Cross, Ark.; tel. and R. R. stn. Little Rock, Ark., dist. 4 m.
**Macon, Fort, N. C.*—P. O. and tel. stn. Beaufort, N. C.; R. R. stn. Morehead City, N. C., dist. 2 m.
Madison Barracks, N. Y. (Dept. East).—P. O., tel. and R. R. stn. Sacket Harbor, N. Y.
**Marion, Fort, Fla.* (Dept. East).—P. O., tel. and R. R. stn. St. Augustine, Fla.
Mason, Fort, Cal. (Dept. Cal.).—P. O. Station A, San Francisco, Cal.; R. R. stn. San Francisco, Cal., dist. 3 m.; street cars ¼ m. from post; tel. stn. at post.
**McClary, Fort, Me.*—P. O., tel. and R. R. stn. Kittery Point, Me.
McHenry, Fort, Md. (Dept. East).—P. O., tel. and R. R. stn. Baltimore, Md.
McIntosh, Fort, Tex. (Dept. Tex.).—P. O., tel. and R. R. stn. Laredo, Tex.
McPherson, Fort, Ga. (Dept. East).—(4 m. from Atlanta, Ga.); P. O., tel. and R. R. stn. same.
Meade, Fort, S. Dak. (Dept. Platte).—P. O. same; tel. and R. R. stn. (F., E. and M. V.) Sturgis City, dist. 3 m.
Merritt Camp (subpost of Fort Keogh, Mont.) (Dept. Dak.).—P. O. Lame Deer, Mont.; tel. and R. R. stn. (N. P. R. R.) Rosebud, Mont.; triweekly stage from Rosebud, dist. 60 m.
**Mifflin, Fort, Pa.*—P. O. Paschallville stn., Philadelphia, Pa.; R. R. and tel. stn. Philadelphia, Pa., dist. 5 m.
Missoula, Fort, Mont. (Dept. Dak.).—P. O. same; tel. and R. R. stn. (N. P.) Missoula, Mont., dist. 4 m.
Monroe, Fort, Va. (Dept. East).—P. O. and tel. stn. same; steamers daily from Baltimore, Washington, Norfolk, and New York, and railroad (C. and O.) from Richmond, Va.
**Montgomery, Fort, N. Y.*—P. O., tel. and R. R. stn. Rouses Point, N. Y., dist. 1½ m.
**Morgan, Fort, Ala.*—P. O. Herndon, Ala.; tel. stn. at post; steamer from Mobile, dist. 30 m.
**Moultrie, Fort, S. C.*—P. O. Moultrieville, S. C.; tel. and R. R. stn. Charleston, S. C., dist. 5 m.
Myer, Fort, Va. (Dept. East).—P. O. same; tel. and R. R. stn. Washington, D. C., dist. 4 m.; telephone to post.
Niagara, Fort, N. Y. (Dept. East).—P. O. Youngstown, N. Y.; tel. stn. Niagara Falls, N. Y.; telephone to Youngstown; R. R. stn. Lewiston, N. Y., dist. 7 m.; electric road to post.

Niobrara, Fort, Nebr. (Dept. Platte).—P. O. and tel. stn. same; R. R. stn. (F., E. and M. V.) Valentine, Nebr., dist. 4½ m.
**Oglethorpe, Fort, Ga.*—P. O., tel. and R. R. stn. Savannah, Ga., dist. 3 m.
**Ontario, Fort, N. Y.* (Dept. East).—P. O., tel. and R. R. stn. Oswego, N. Y.
* *Phœnix, Fort, Mass.*—P. O., R. R. and tel. stn. Fairhaven, Mass.
* *Pickens, Fort, Fla.*—P. O. Warrington, Fla.; tel. stn. Pensacola Navy-Yard; R. R. stn. at Fort Barrancas, Fla., dist. 1 m.
Pilot Butte, Camp (subpost of Fort D. A. Russell, Wyo.) (Dept. Platte).—P. O., tel. and R. R. stn. (U. P.) Rock Springs, Wyo.
Plattsburg Barracks, N. Y. (Dept. East).—P. O., tel. and R. R. stn. Plattsburg, N. Y.
* *Popham, Fort, Me.*—P. O. Popham Beach, Me.; tel. and R. R. stn. Bath, Me., dist. 12 m. by water, 15 m. by land.
Porter, Fort, N. Y. (Dept. East).—P. O., tel. and R. R. stn. Buffalo, N. Y.
Preble, Fort, Me. (Dept. East).—P. O., tel. and R. R. stn. Portland, Me., dist. 1¼ m.
Presidio of San Francisco, Cal. (Dept. Cal.).—P. O. and tel. stn. same; R. R. stn. San Francisco, Cal., dist. 4½ m.; city railway to post.
* *Pulaski, Fort, Ga.*—P. O., R. R. and tel. stn. Savannah, Ga., dist. 14 m.
Reno, Fort, Okla. (Dept. Mo.).—P. O., tel. and R. R. stn. same.
Riley, Fort, Kans. (Dept. Mo.).—P. O., tel. and R. R. stn. same.
Ringgold, Fort, Tex. (Dept. Tex.).—P. O. Rio Grande, Tex.; tel. stn. at post; stage from Hebbronville, on Mex. N. R. R., dist. 76 m., and from San Miguel, Mex., on Mex. N. R. R., dist. 23 m.
Robinson, Fort, Nebr. (Dept. Platte).—P. O., tel. and R. R. stn. (F., E. and M. V.) same.
Sam Houston, Fort, Tex. (Dept. Tex.).—P. O., tel. and R. R. stn. San Antonio, Tex.
San Carlos (subpost of Fort Grant), *Ariz.* (Dept. Colo.).—P. O. and tel. stn. same; daily stage from Geronimo, Ariz., terminus of Gila Valley, Globe and Northern R. R., dist. 35 m.
San Diego Barracks, Cal. (Dept. Cal.).—P. O., tel. and R. R. stn. (C. S.) and boat ldg. San Diego, Cal.
**Scammel, Fort, Me.*—P. O., tel. and R. R. stn. Portland, Me., dist. 2 m.
Schuyler, Fort, N. Y. (Dept. East).—P. O., tel. and R. R. stn. West Chester, N. Y., dist. 4½ m.
Sequoia National Park, Cal. (Dept. Cal.).—P. O. Three Rivers, Cal.; tel. and R. R. stn. Exeter, Cal., dist. 36 m.
**Sewall, Fort, Mass.*—P. O., tel. and R. R. stn. Marblehead, Mass., dist. 1½ m.
Sheridan, Fort, Ill. (Dept. Mo.).—P. O., R. R. and tel. stn. same.
Sherman, Fort, Idaho (Dept. Columbia).—P. O. Sherman, Idaho; tel. and R. R. stn. Cœur d'Alene, Idaho (on branch N. P. R. R.), dist. ¾ m.
**Ship Island, Miss., Fort at.*—P. O., tel. and R. R. stn. (L. and N.) Biloxi, Miss., dist. 15 m.; special boat to post.
Sill, Fort, Okla. (Dept. Mo.).—P. O. and tel. stn. same; stage daily from Rush Springs, Ind. T., on C., R. I. and P. R. R., dist. 29 m.
Slocum, Fort, N. Y. (Dept. East).—P. O. and tel. stn. New Rochelle, N. Y.; horse car and boat from New Rochelle, dist. 3 m.
Snelling, Fort, Minn. (Dept. Dak.).—P. O., tel. and R. R. stn. same; electric st. R. R. to St. Paul, Minn., dist. 7 m.
Spokane, Fort, Wash. (Dept. Columbia).—P. O. Miles, Wash.; tel. and R. R. stn. Davenport, Wash., on C. W. R. R., dist. 25 m.
**Stevens, Fort, Oreg.*—P. O. and tel. stn. (Govt. tel. to post) Astoria, Oreg.; steamer daily from R. R. stn. Portland, Oreg., to Astoria, dist. 98 m.
St. Francis Barracks, Fla. (Dept. East).—P. O., tel. and R. R. stn. St. Augustine, Fla.
**St. Philip, Fort, La.*—P. O. Neptune, La.; tel. stn. Old Quarantine stn., La.; steamer daily (except Sunday) from New Orleans, dist. 73 m.
**Sumter, Fort, S. C.*—P. O. Moultrieville, S. C.; tel. and R. R. stn. Charleston, S. C., dist. 5 m.
**Taylor, Fort, Fla.*—P. O., tel. stn. and boat ldg. Key West, Fla.
Thomas, Fort, Ky. (Dept. East).—P. O., tel. and R. R. stn. Newport, Ky., dist. 3 m.
Trumbull, Fort, Conn. (Dept. East).—P. O., tel. and R. R. stn. New London, Conn., dist. 1 m.
Vancouver Barracks, Wash. (Dept. Columbia).—P. O. and boat ldg. Vancouver, Wash.; tel. stn. at post; R. R. stn. at Portland, Oreg.; boat from Portland, Oreg., daily, dist. 18 m., and by ferry and city railroad, dist. 9 m.
Wadsworth, Fort, N. Y. (Dept. East).—P. O. Rosebank, Staten Island, N. Y.; tel. stn. Quarantine, Clifton, Staten Island, N. Y.
Walla Walla, Fort, Wash. (Dept. Columbia).—P. O., tel. and R. R. stn. (O. R. and N. Co. and W. and C. R. R. R.) Walla Walla, Wash., dist. 1 m.
Warren, Fort, Mass. (Dept. East).—P. O. and tel. stn. Boston, Mass.; steamer from Boston, dist. 7 m.
Washakie, Fort, Wyo. (Dept. Platte).—P. O. and tel. stn. same; daily stage from Rawlins, Wyo., on U. P. R. R., dist. 147 m.

Washington Barracks, D. C. (Dept. East).—P. O., tel. and R. R. stn. Washington, D.
Washington, Fort, Md. (Dept. East).—P. O. same; tel. stn. Alexandria, Va.; stage from Washington, D. C., dist. 13 m.
Wayne, Fort, Mich. (Dept. Mo.).—P. O. and tel. stn. Detroit, Mich.; city railway to Detroit, dist. 4 m.
West Point, N. Y. (U. S. Mil. Acad.).—P. O., tel. and R. R. stn. same.
Whipple Barracks, Ariz. (Dept. Colo.).—P. O. and R. R. stn. Whipple, Ariz.; tel. to Prescott, Ariz.
Willets Point, N. Y. (U. S. Engineer School).—P. O. and tel. stn. same; R. R. stn. Whitestone, N. Y., dist. 2½ m. (See Engineer Depot.)
* *Winfield Scott, Fort, Cal.* (Dept. Cal.).—P. O. and tel. stn. Presidio of San Francisco, Cal.; R. R. stn. San Francisco, Cal.
Wingate, Fort, N. Mex. (Dept. Colo.).—P. O. and tel. stn. same; R. R. stn. (A. and P.) Wingate, dist. 3 m.
* *Winthrop, Fort, Mass.*—P. O. and tel. stn. Boston, Mass.; stmbt. from Boston, dist. 2 m.
Wood, Fort (subpost of Fort Columbus), *N. Y.* (Dept. East).—P. O., tel. and R. R. stn. N. Y. City.
Yates, Fort, N. Dak. (Dept. Dak.).—P. O. and tel. stn. same; R. R. stn. Mandan, on N. P. R. R.; stage daily (except Sunday) from Bismarck, N. Dak., dist. 60 m.
Yellowstone, Fort, Wyo. (Dept. Dak.).—P. O. Mammoth Hot Springs, Wyo.; tel. stn. June 1 to October 1, Mammoth Hot Springs, October 1 to May 31, Cinnabar, Mont.; R. R. stn. Cinnabar, Mont., via Livingston, on N. P. R. R., dist. 8 m.
Yosemite National Park, Cal. (Dept. Cal.).—P. O. and tel. stn. Wawona, Cal.

ARMORIES, ARSENALS, AND DEPOTS.

ARMORIES, ARSENALS, AND ORDNANCE DEPOTS.

Allegheny Arsenal, Pa.—P. O., tel. and R. R. stn. Pittsburg, Pa.; Lt. Col. J. P. Farley, comdg.
Augusta Arsenal, Ga.—P. O., tel. and R. R. stn. Augusta, Ga., dist. 3 m.; electric R. R. from Augusta to Arsenal; Capt. D. M. Taylor, comdg.
Benicia Arsenal, Cal.—P. O., tel. and R. R. stn., and boat landing Benicia, Cal., dist. 1 m.; Lieut. Col. L. S. Babbitt, comdg.
Columbia Arsenal, Tenn.—P. O., tel. and R. R. stn. Columbia, Tenn.; Maj. J. E. Greer, comdg.
Fort Monroe Arsenal, Va.—P. O. and tel. stn. Fort Monroe, Va.; stmbts. daily from New York, Baltimore, Washington, and Norfolk, and railroad (C. and O.) from Richmond, Va.; Lieut. Col. W. A. Marye, comdg.
Frankford Arsenal, Pa.—P. O. (Station F) and tel. stn. (telephone to post) Philadelphia, Pa.; Col. J. M. Whittemore, comdg.
Indianapolis Arsenal, Ind.—P. O., tel. and R. R. stn. Indianapolis, Ind.; Maj. A. L. Varney, comdg.
Kennebec Arsenal, Me.—P. O., tel. and R. R. stn. Augusta, Me.; Maj. J. R. McGinness, comdg.
New York Arsenal, N. Y.—P. O. and tel. stn. Governors Island, New York City; Govt. steamer to post; Maj. F. H. Phipps, comdg.
Rock Island Arsenal, Ill.—P. O. and tel. stn. Rock Island, Ill.; special conveyance from R. R. stns. and boat ldgs. in Rock Island, Ill., and Davenport, Iowa, dist. 2 m.; Capt. S. E. Blunt, comdg.
St. Louis Powder Depot, Mo.—P. O., tel. and R. R. stn. Jefferson Barracks, Mo.; Maj. J. A. Kress, comdg.
Sandy Hook Proving Ground, N. J.—P. O., Governors Island, New York City; tel. stn. Sandy Hook, N. J.; Govt. steamer daily from New York City, dist. 20 m.; Capt. Frank Heath, comdg.
San Antonio Arsenal, Tex.—P. O., tel. and R. R. stn. San Antonio, Tex.; Maj. C. E. Dutton, comdg.
Springfield Armory, Mass.—P. O., tel. and R. R. stn. Springfield, Mass.; Col. A. Mordecai, comdg.
U. S. Powder Depot, N. J.—P. O., tel. (telephone to post) and R. R. stn. Dover, N. J., dis. 4½ m.; Col. A. R. Buffington, comdg.
Watertown Arsenal, Mass.—P. O., tel. and R. R. stn. Watertown, Mass.; Maj. J. W. Reilly, comdg.
Watervliet Arsenal, N. Y.—P. O. and tel. stn. (telephone to post) Watervliet, N. Y.; R. R. stn. Troy, N. Y., dist. 1 m.; electric street cars to Albany, N. Y.; Lieut. Col. Isaac Arnold, jr., comdg.

RECRUIT RENDEZVOUS.

Fort Slocum, N. Y.—P. O. and tel. stn. New Rochelle, N. Y.; horse car and boat from New Rochelle, dist. 3 m.
Columbus Barracks, Ohio.—P. O. and R. R. stn. Columbus, Ohio; tel. stn. at post.
Jefferson Barracks, Mo.—P. O., tel. and R. R. stn. same.
Fort Sheridan, Ill.—P. O., tel. and R. R. stn. same.

ENGINEER DEPOT.

Willets Point, N. Y.—P. O. and tel. stn. same; R. R. stn. Whitestone, Queens County, N. Y., dist. 2½ m.; Maj. J. G. D. Knight, comdg.

HEADQUARTERS OF REGIMENTS.

CAVALRY.

1. Fort Riley, Kans.
2. Fort Wingate, N. Mex.
3. Fort Ethan Allen, Vt.
4. Fort Walla Walla, Wash.
5. Fort Sam Houston, Tex.
6. Fort Myer, Va.
7. Fort Grant, Ariz.
8. Fort Meade, S. Dak.
9. Fort Robinson, Nebr.
10. Fort Assinniboine, Mont.

ARTILLERY.

1. St. Francis Barracks, Fla.
2. Fort Adams, R. I.
3. Angel Island, Cal.
4. Washington Barracks, D. C.
5. Fort Hamilton, N. Y.

INFANTRY.

1. Presidio of San Francisco, Cal.
2. Fort Keogh, Mont.
3. Fort Snelling, Minn.
4. Fort Sheridan, Ill.
5. Fort McPherson, Ga.
6. Fort Thomas, Ky.
7. Fort Logan, Colo.
8. Fort D. A. Russell, Wyo.
9. Madison Barracks, N. Y.
10. Fort Reno, Okla.
11. Whipple Barracks, Ariz.
12. Fort Niobrara, Nebr.
13. Fort Porter, N. Y.
14. Vancouver Barracks, Wash.
15. Fort Bayard, N. Mex.
16. Fort Sherman, Idaho.
17. Columbus Barracks, Ohio.
18. Fort Bliss, Tex.
19. Fort Wayne, Mich.
20. Fort Leavenworth, Kans.
21. Plattsburg Barracks, N. Y.
22. Fort Crook, Nebr.
23. Fort Clark, Tex.
24. Fort Douglas, Utah.
25. Fort Missoula, Mont.

ADJUTANT GENERAL'S OFFICE,
Washington, D. C., October 1, 1897.

D.—*Statement showing gain and loss in the enlisted strength of the Army during the fiscal year ended June 30, 1897.*

GAIN.

Enlisted	5,332
Reenlisted	3,112
From desertion	304
Total	8,748

LOSS.

Discharged for promotion	19
Discharged by expiration of service	2,374
Discharged for disability	381
Discharged by sentence of general court-martial	533
Discharged for fraudulent enlistment	41
Discharged by favor	332
Discharged as veterans	112

D.—*Statement showing gain and loss in the enlisted strength of the Army during the fiscal year ended June 30, 1897*—Continued.

Discharged by purchase	140
Discharged under General Orders No. 80 of 1890	2,603
Discharged for other causes	398
Retired	155
Died of disease	125
Deserted	1,051
Total	8,264
Enlisted strength June 30, 1896	24,869
Gain	8,748
Total	33,617
Loss	8,264
Enlisted strength June 30, 1897	[1] 25,353

[1] In this are included 710 men of the Hospital Corps, which by law are excluded from the 25,000 enlisted men authorized, leaving the actual strength on June 30, 1897, of 24,643 enlisted men, including 72 Indian scouts.

REPORT OF THE INSPECTOR-GENERAL.

WAR DEPARTMENT, INSPECTOR-GENERAL'S OFFICE,
Washington, D. C., October 18, 1897.

SIR: I have the honor to submit the following report of matters pertaining to this department:

INSPECTOR-GENERAL'S DEPARTMENT.

There has been no change in the personnel of the permanent officers of the Inspector-General's Department during the past fiscal year. The subordinate officers of the department have been on duty during the year at stations as follows:

Col. R. P. Hughes, inspector-general, North Atlantic district, New York City, N. Y., returned from travel abroad on leave of absence granted by Special Orders, No. 66, Adjutant-General's Office, of March 19, 1896, and resumed his duties November 2, 1896.

Col. G. H. Burton, inspector-general, Pacific district, San Francisco, Cal.

Lieut. Col. H. W. Lawton, inspector-general, Southern district, Santa Fe, N. Mex., his station now being Los Angeles, Cal.

Lieut. Col. P. D. Vroom, inspector-general, Middle district, Chicago, Ill.

Maj. J. P. Sanger and Maj. E. A. Garlington, inspectors-general, continued on duty as assistants to the Inspector-General of the Army, and as inspectors-general of the South Atlantic district, the latter officer returning from leave of absence on August 21, 1896.

Maj. Francis Moore, Fifth Cavalry, acting inspector-general, Northern district, Denver, Colo.

Maj. H. C. Hasbrouck, Fourth Artillery, continued on duty as acting inspector-general, North Atlantic district, until the return of Colonel Hughes, when he was relieved.

The following officers were detailed as inspectors of the military departments of certain educational institutions where officers of the Army are detailed under section 1225, Revised Statutes, as amended by the act of November 3, 1893, under instructions contained in letter from the Adjutant-General of the Army of April 19, 1897, and May 17, 1897, and letters from the Inspector-General of the Army of April 21, 1897, and May 25, 1897: Col. J. Ford Kent, Twenty-fourth Infantry; Maj. James Jackson, Second Cavalry; Capt. C. S. Roberts, Seventeenth Infantry; Capt. Wm. V. Richards, Sixteenth Infantry; Capt. E. Swift, Fifth Cavalry; Capt. Geo. K. Hunter, Third Cavalry; Capt. Geo. B. Walker, Sixth Infantry; Capt. A. R. Paxton, Fifteenth Infantry; First Lieut. J. de L. Lafitte, First Infantry.

Statement of work performed by the permanent officers of the Inspector-General's Department and the officers specially detailed.

Officer.	Station or district.	Disbursements.		Posts.	Staff posts, soldiers' homes, branches, depots.	Colleges.
		Number of inspections.	Amount involved.			
Brig. Gen. J. C. Breckinridge	Washington, D. C	10	$8,597,366.85	....	8	2
Col. R. P. Hughes	North Atlantic	78	10,727,350.59	....	4	21
Col. G. H. Burton	Pacific	139	6,833,305.03	15	5	3
Lt. Col. H. W. Lawton	Southern	73	3,938,473.42	16	1	5
Lt. Col. P. D. Vroom	Middle	193	20,155,581.96	8	11	6
Maj. J. P. Sanger	South Atlantic	89	10,033,765.63	9	12	11
Maj. E. A. Garlington	do	64	5,885,922.79	....	14	18
Maj. Francis Moore	Northern	79	6,469,203.38	16	4	16
Maj. H. C. Hasbrouck	North Atlantic	68	4,560,925.27	16	10	....
Total		793	77,201,894.92	80	69	82
Special inspectors.						
Col. J. Ford Kent	Fort Douglas, Utah	.....	.....	....	.....	1
Maj. James Jackson	Portland, Oreg	.....	.....	....	.....	2
Capt. C. S. Roberts	Columbus Barracks, Ohio	.....	.....	....	.....	5
Capt. W. V. Richards	Fort Sherman, Idaho	.....	.....	....	.....	2
Capt. E. Swift	Springfield, Ill	.....	.....	....	.....	5
Capt. G. K. Hunter	Jefferson Barracks, Mo	.....	.....	....	.....	1
Capt. G. R. Walker	Fort Thomas, Ky	.....	.....	....	.....	3
Capt. A. R. Paxton	Harrisburg, Pa	.....	.....	....	.....	1
Lieut. J. de L. Lafitte	New Orleans, La	.....	.....	....	.....	1
Total		.....	.....	....	.....	21
Grand total		793	77,201,894.92	80	69	103

Officer.	Students.	National cemeteries.	Recruiting rendezvous and stations.	Special investigations.	Sets of inventory and inspection reports.	Persons inspected, exclusive of students.	Total inspections.	Ascertained cost price of property inspected.	Miles traveled.
Brig. Gen. J. C. Breckinridge	255	.....	.....	.....	.....	18,155	20	.....	12,665
Col. R. P. Hughes	2,563	.....	4	.....	27	.....	134	$9,300.99	4,009
Col. G. H. Burton	642	1	3	2	209	3,813	377	165,720.70	12,802
Lt. Col. H. W. Lawton	580	3	1	6	192	4,379	297	120,123.94	17,484
Lt. Col. P. D. Vroom	907	7	15	.....	257	4,722	497	182,224.73	11,865
Maj. J. P. Sanger	1,777	24	4	4	92	2,484	245	31,196.56	10,341
Maj. E. A. Garlington	2,045	15	1	1	60	.....	173	44,752.41	11,329
Maj. Francis Moore	1,750	1	.....	.....	330	4,972	446	117,219.63	11,208
Maj. H. C. Hasbrouck	.....	1	1	.....	169	4,223	265	37,138.03	2,745
Total	10,519	52	29	13	1,336	42,748	2,454	707,676.99	94,448
Special inspectors.									
Col. J. Ford Kent	85	.....	.....	.....	.....	.....	1	.....	208
Maj. James Jackson	178	.....	.....	.....	.....	.....	2	.....	564
Capt. C. S. Roberts	762	.....	.....	.....	.....	.....	5	.....	426
Capt. W. V. Richards	134	.....	.....	.....	.....	.....	2	.....	256
Capt. E. Swift	568	.....	.....	.....	.....	.....	5	.....	734
Capt. G. K. Hunter	121	.....	.....	.....	.....	.....	1	.....	20
Capt. G. R. Walker	65	.....	.....	.....	.....	.....	3	.....	1,082
Capt. A. R. Paxton	67	.....	.....	.....	.....	.....	1	.....	72
Lieut. J. de L. Lafitte	146	.....	.....	.....	.....	.....	1	.....	.....
Total	2,126	.....	.....	.....	.....	.....	21	.....	3,362
Grand total	12,645	52	29	13	1,336	42,748	2,475	707,676.99	97,810

With the students the number inspected is 55,393.

GENERAL IMPRESSION.

Beginning with the line as the principal part of the military establishment, it may be submitted that the scope of both theoretical and practical military instruction in each of the three arms of the service appears to have been more comprehensive than in any preceding year and with promising efforts toward further improvement. The beneficial effects of this careful attention appear noticeable even in details.

In the cavalry, instruction in individual horsemanship has received general attention. The course of equitation, as prescribed in the Cavalry Drill Regulations, is being very thoroughly and extensively applied. Wherever proper facilities exist, this instruction has progressed systematically with reasonable success. The good results are evidenced in the better horsemanship of the individual soldier and improvement in the training of the cavalry horse and the more perfect ensemble of the organizations.

The recent change in artillery armament has at some places been very radical, and thorough familiarity with and instruction in the new system are of the first importance, and any adequate test of the practical efficiency for immediate military service under the modern system for the artillery must embrace the complete service of the cannon, torpedoes, magazines, range finding, supply of ammunition, means of rapid communication, field defenses, the care and transport of the wounded, mobility of the light artillery, and all that is essential to a state of sudden war.

For the infantry the proficiency required was never so great, and the time, if not the means, for instruction and preparation may seem severely limited; so the efforts of the officers have to be redoubled. Thoroughness rather than show, reliability rather than display, are essential; and the testimony of the inspectors general has generally been favorable to the good qualities displayed by the several military organizations.

All recognize how novel the weapons placed in the hands of the soldiers at present are, and how exacting must be the practice with them until the men are familiarized with the peculiarities and powers of the new implements. As far as the duties of this department touched specially upon the instruction, discipline, harmony, economy, and efficiency of the line the reports throughout still generally indicated the customary satisfactory condition during the past fiscal year.

MILITARY POSTS.

During the past fiscal year the officers of this department have inspected all the garrisoned posts; which, for the purposes of the inspections, were distributed among the inspection districts as follows: North Atlantic, 16; South Atlantic, 9; Middle, 8; Northern, 16; Southern, 16; and the Pacific, 15; or 80 in all, including 2 subposts. This is the first time for several years that every permanently garrisoned post has been thus inspected, and this success may be partially due to the prevailing system. The various reports show that the work has been done in a thoroughly efficient manner, and it is gratifying to note the spirit with which this system of rigid inspections is received by the large body of progressive officers in our service; each advance in the tests applied has more clearly demonstrated the general excellence of the organizations inspected.

The posts are generally reported in good repair and excellent police. At some, even permanent, posts, particularly in the North and South

Atlantic districts and on the southern portion of our country, the officers' quarters and barracks are reported as unsuitable or unsanitary. The most suitable form for dormitory or ward is said to be that which allows only two rows of beds, with equal provision for light and air to each; and preference is expressed for a fairer allowance of porches, lockers, and artificial light: and the proper distance for barracks and quarters seems an important question, both of propriety and comfort; and doubtless it is duly recognized that the people who have to live at the post must have some experience worthy of consideration in such matters. The greatly improved quality of recent constructions is generally very noticeable.

REVIEWS AND INSPECTIONS.

The troops at all the posts were habitually reviewed and inspected in full dress, and subsequently seen in heavy marching order. The uniforms, arms, and equipments were generally found in excellent order. Where defects were reported, they were of a minor character and easily remedied. At some of the posts the troops were not provided with shelter tents.

The scope of inspection during the year has included practical problems for each arm and for combined operations where opportunity and means are provided; and the seacoast batteries were also thus tested when practicable. That every branch of military activity is fairly entitled to similar and equally skillful tests and scrutiny seems self-evident; and the requirements of war, simulated when not actual, are recognized among soldiers generally as the only complete tests of military fitness and condition.

To fully test the practical knowledge and effectiveness of the drill, in close and extended order and firing exercises, requires occasionally the expenditure of sufficient ammunition and target material, which of course should be properly provided.

The following return gives data concerning the troops at the time of inspection; the percentage absent from inspection seems noticeable.

[The data in the colums under "Present and absent" and "Present at post" is complete for all the posts; and in the columns under "Present at inspection" the data is complete except, under "Commissioned officers" 12 posts, and "Enlisted men" 11 posts.]

Inspection districts.	Garrisons.								Present and absent.		Present at post.		Present at inspection.	
	Organizations.					Detachments.			Commissioned officers.	Enlisted men.	Commissioned officers.	Enlisted men.	Commissioned officers.	Enlisted men.
	Bands.	Troops.	Batteries.	Companies.	Skeleton organizations.	Recruits.	Indian scouts.	Other.						
North Atlantic	7	4	20	29	7	1	....	3	323	4,326	240	3,983	116	2,080
South Atlantic	4	4	24	8	4	....	....	....	216	2,485	165	2,319	153	1,880
Middle	6	8	1	42	12	3	....	....	254	3,410	183	3,148	164	2,493
Pacific	6	12	8	36	....	....	....	....	306	3,913	198	3,615	127	1,823
Northern	10	44	3	52	20	....	....	1	480	6,398	327	5,838	285	4,671
Southern	7	29	1	39	15	....	5	1	347	4,528	234	4,145	217	3,388
Total	40	101	57	206	58	4	5	5	1,926	25,060	1,347	23,048	1,062	16,335

Inspection districts.	Absent from post.												
	Commissioned officers.						Enlisted men.						
	Detached service.	Leave.	Sick.	In quarantine.	Awaiting retirement.	Under orders to join.	Detached service.	Furlough.	Without leave.	Sick.	In arrest or confinement.	On pass.	Reasons not stated.
North Atlantic	62	17	4	.....	.....	.....	84	217	30	3	7	2	.....
South Atlantic	41	9	1	.....	.....	.....	13	138	3	6	6	.....	.....
Middle	52	17	2	.....	.....	.....	73	168	8	8	5	.....	.....
Northern	105	41	6	1	.....	.....	135	256	5	2	6	.....	156
Southern	96	13	1	.....	1	2	2	56	.....	.....	3	.....	322
Total	356	97	14	1	1	2	307	835	46	19	27	2	478

Inspection districts.	Present at post, but absent from inspection.															
	Commissioned officers.								Noncommissioned officers.							
	Guard.	Sick.	Special duty.	Skeleton troops.	Arrest.	Chaplain.	Excused.	Reasons not stated.	Guard.	Sick.	Extra duty.	Special duty.	In arrest or confinement.	Without leave.	Dismounted.	In charge of quarters.	Other reasons.
North Atlantic	4	5	5	....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Atlantic	5	1	2	4	....	....	....	....	16	8	.....	2	1	.....	.....	3	....
Middle	7	4	8	....	....	....	....	....	25	11	4	15	1	.....	.....	23	....
Northern	11	6	2	....	2	9	6	6	51	33	5	42	2	2	9	....	5
Southern	4	5	5	....	....	....	....	3	41	7	.....	30	2	.....	.....	....	3
Total	31	21	22	4	2	9	6	9	133	59	9	89	6	2	9	26	8

Inspection districts.	Present at post, but absent from inspection.																	
	Artificers, musicians, and privates.																	
	Guard.	Sick.	Extra duty.	Special duty.	In arrest or confinement.	Recruits.	Cooks.	Orderlies.	Room and stable orderlies.	Dismounted.	General prisoners.	Bakers.	On pass.	Post mess.	Gardeners.	Teamsters.	Without leave.	Other reasons.	Reasons not stated.
North Atlantic	156	71	....	3	42	42	33	....	6	....	79	12	3	18	....	....	....	100	....
South Atlantic	129	81	31	59	27	47	8	....	9	10	....	....	....	....	....	....	....	8	....
Middle	166	105	28	136	52	76	....	....	7	....	....	....	....	....	....	....	....	6	....
Northern	260	201	7	8	61	119	105	4	66	40	....	16	4	21	2	4	10	23	69
Southern	209	118	6	69	42	90	60	6	29	13	....	9	14	....	....	....	1	8	....
Total	920	576	72	275	224	374	206	10	117	63	79	37	21	39	2	4	11	145	69

YOUNGER AND BETTER MEN AND HORSES.

The enthusiasm for soldiering, pure and simple, whether at posts or in the field, is finding a new impetus. Officers and men are imbued with the necessity for a still higher training than ever known before. Schools have improved, and must continue to improve as the demands and requirements of the service upon all ranks continually increase. All admit we should have the best attainable men, horses, and weapons, and that these men and horses should be trained as perfectly as possi-

ble and familiarized, not only with the simple and individual and easiest, but also with the combined and most difficult use of the weapons of the three arms of the service.

The earnest efforts of the departments of the service immediately in charge of these matters have effected great improvements in the past; and the service can not soon, and will probably never, lose the benefit of these efforts; and such steadily energetic administration of affairs must still insure great improvement and development in the established system. There may have been a time when the best could hardly be attained: but that was before our service received its men and horses young enough to be properly receptive to a perfect military training, or when only our officers were received in the plastic years of youth and trained to the finest quality they were capable of. But with so large a country and so small an army as ours there is no adequate reason that the same principle which has given us the best attainable results in one direction should not be applied all around, so our Army shall be recognized as fully representative of our people and our noncommissioned officers everywhere shall be as absolutely satisfactory as most of them are now. Despite the great advance already effected, perhaps it might still be submitted that the system of training both recruits and remounts needs attention and readjustment. The quality and suitability of those recently furnished are a decided improvement upon the past, and the training should keep pace with this improvement. When horses were received in our service at an age at which they begin to condemn them in Europe, and men were enlisted here at an age after their military training had been completed there, the difficulties here in the way of perfect military training were introduced at the beginning, and our line officers are entitled to the greatest credit for creating from such obdurate material as was formerly furnished them such admirable organizations as have established the fame of our Army. The practice may never have been as bad as the regulations, when in old times even stripes were allowed as punishment; but the improvement has been marked, and every advantage should be taken to benefit from the opportunities now given.

INSTRUCTION OF RECRUITS.

It seems that the best results in the instruction and training of the recruit are often obtained by organizing in each regiment or post recruit detachments, to which each recruit is attached upon his arrival at the post; an officer possessing special qualifications for this character of work being assigned to command the detachment, and the necessary noncommissioned officers, specially selected, detailed as his assistants. Where this system is adopted each recruit should remain with the detachment until he is reported "ready for guard" by his detachment commander. But in this, as in all things, it is not desirable that the connection between the soldier and his company and its commander should ever be severed; nor is this divorce required to allow the military service the full benefits of the graded and best system of instruction.

GYMNASTICS.

Instruction in gymnastics in some form or other appears to have been given at about 95 per cent of the military posts, and the tendency to recognize the importance of having enlisted men acquire the art of swimming seems to be on the increase. At one post it has been reported

that the commanding officer is determined to have all his men learn to swim. The percentage of posts having suitably equipped gymnasium buildings is smaller than the importance of the subject would seem to warrant. That the physical development of the soldier is of the very highest importance—greater, perhaps, than in any other profession—will hardly be questioned, and the most approved way of securing it is by systematic athletic exercise, both indoors and out, under the direction of experienced instructors. That the soldiers themselves are much interested in this branch of training is evident from the fact that in many organizations they have bought apparatus and fitted up, with little or no expense to the Government, small gymnasiums in their barracks.

Both the physical and mental training of our soldiers continues to call for special attention. The demands upon them in the centuries of savage warfare, and as workmen at the posts constantly being constructed, and as experienced and hardy soldiers always ready for every emergency, have hitherto been well met, and nothing more seemed possible. But now there seems an awakening to the demands of the future, and the best means of physical and mental training may now be adopted, so that every fine old trait may be retained and, if possible, improved under the new, more comfortable, and less exacting surroundings.

APPRENTICE BATTALION.

During the height of the earnest and successful effort to improve our old, effete methods and elevate the type of our noncommissioned officers and soldiers, one of the most promising suggestions was to establish apprentice battalions, which are still sadly needed. Their introduction would mark an epoch in the thorough training and proper instruction of our Army. The proportion of citizens of military age already habituated to handling arms and experienced in field service must be expected to steadily diminish until it reaches a minimum. Nearly three centuries have marked the contest with the aborigines and our conquest of a continent, as well as occasional civilized wars. Evidently some military reserve is now needed, and some special effort to meet this lack of experience with whatever instruction and training can be properly given. Doubtless worthy youths would flock eagerly into the ranks of an apprentice battalion, affording, as it will, not only an education but profitable employment at exactly the age when lads begin to cast about for means of maintaining themselves, and promising them a career of usefulness and honor. Nowadays, when it seems wars are half fought before they are formally declared, no time will be given us to train officers; and if all Americans are born generals, still some training will not injure them. Coming, as they will, from our native population, these young soldiers, comparatively few in number though they might be, would tend by their presence and influence to Americanize the Army and elevate its general tone. It is a matter which deserves earnest attention, and the practical adoption of such a feature in our service will be economical, creditable, and an enduring benefit.

If the man from the ranks is ever to be given an equal show in the race of life he must be taken young enough for the start and for training and for weeding out. The Army should be made representative of the nation. We are hardly given a fair chance to instruct and train our soldiers. Our boys will take arms when wars come, and we can not let them fail in this high duty, nor make them throw away their young lives from dense ignorance of the first elements of soldierly life and habits; and there is a depth of pity in their useless deaths from lack of military knowledge and experience. Bullets are not the most deadly

things in war. There is a fatality in ignorance; and every effort to minimize and remove it becomes the bounden duty of a free country, which relies wholly upon the voluntary pledges of its sons to defend it.

Our Army deserves to be held in high esteem, and the regiments are held in kindly esteem where they are known, especially by the classes of the people who have a taste for military affairs. Two methods offer themselves to acquaint our people always with the commendable character of our veteran soldiers. One, to localize certain regiments under the best recruiting officers, so in the course of years the character of the recruits will necessarily be known at their own homes when they start to enlist, and within the regiments when they arrive, and no incorrigibles can be admitted; and the other is to establish a battalion of apprentices, raised so as to represent the whole country, and assigned, after thorough training, to certain designated permanent organizations until the type is thoroughly established in the service. Both plans have great merits, and, together or separate, would tend to elevate the tone of the service; and all see that a regiment of trained élèves from such an apprentice system will have qualities any army should desire, and regiments of such a thoroughly trained personnel would especially be of inestimable advantage as models to our National Guard.

DRILLS, EXERCISES, AND PRACTICAL MILITARY PROBLEMS.

The reports indicate an improvement in drill, and in several reports special mention is made of an advance in individual training; but it is apparent that there is still room for improvement in this regard, as practically nearly all of the defects noted are traceable to superficial work in the school of the soldier or lack of recent and personal command in certain military exercises by some individual present.

Upon the interesting and important subject of artillery drill, as to which there appears to be some difference in practice now deserving special attention in this time of rearmament, Major Sanger says:

> Paragraph 24 of the Manual prescribes the formation of a foot battery, and paragraph 127 that of an artillery battalion, and their maneuvers are fully described. Paragraph 130, referring to the battalion formation, defines it to be "The habitual formation of an artillery battalion, serving as artillery, to be used for occasions of drill and ceremonies." It has been the practice to ignore these requirements; the battalions have been habitually formed and maneuvered as infantry, and know but little of the prescribed artillery maneuvers. It is only when foot batteries "are armed, equipped, and serving as infantry or cavalry, and organized into commands of these arms, that they are to conform to the formation and tactics prescribed respectively for these branches." (M. H. A., par. 49). Apart from the time consumed in teaching infantry drill, which in view of all that is now required of foot artillery, is a great imposition on the officers and enlisted men, it would seem that there should be an end to the anomaly of maintaining batteries of artillery on an infantry basis, when there is no reason for doing so. Occasional street marching, whether to suppress riots or for ceremonial purposes, is certainly no reason, when it can be demonstrated that the prescribed marching maneuvers are all sufficient for this purpose.
>
> The daily formation and instruction of the batteries should be in harmony with their organizaion, as prescribed by law and the Drill Regulations, and should be confined to the subjects essential to their efficiency in war. They should not be expected, nor should they be required to devote their time to the close order drill of infantry, for which their own marching drill is an excellent and all-sufficient substitute. Organized and employed as artillery, the batteries should always be formed and instructed as artillery, and not have their time occupied and their attention diverted by even an exceptional resort to the formations and instruction of another and distinct arm of the service, if it is expected that they are ever to be proficient in the course of practical and theoretical artillery drill now prescribed.

Lieut. Col. H. C. Hasbrouck, on the same subject, says:

> The service of the guns and the mechanical maneuvers were well executed by the heavy artillery. The gunners showed familiarity and address in the use of angle-measuring instruments and the plotting board. * * *

In the cavalry the reports show the individual training of the trooper and horse is improving, but there is yet something to be accomplished in this field. The chief object of cavalry training is to so train the unit as to successfully deliver a charge, and in order to do this the Cavalry Drill Regulations of 1896 prescribes that (1) the trooper must have complete control over his horse; (2) the horse must be thoroughly trained; (3) the trooper must be taught to ride straight to the front; (4) the gait must be uniform in speed, and (5) that the horse must not arrive at the charging point in a blown or distressed condition.

The reports of inspection show that these conditions have not been attained, though approximated more closely than heretofore. Uniformity of gait and riding straight to the front are the basis of cavalry drill. Every drill ground should have a straight course of a mile, permanently marked; if that is not practicable a half a mile, at least, should be marked. The troops and squadron should at every drill be marched over this course at all gaits and in different formations until the gaits are firmly established. Every officer in charge of a drill should insist that all maneuvering be done at the regulation gaits.

The track in every riding hall should be accurately measured and the rate of march over it at the different gaits be plainly posted in the halls, and this rate be insisted upon, under all conditions, by the officers superintending drill. It is only by strict observance of these details that uniformity of gait can be attained. In this connection it may be well to repeat my recommendation of last year, viz:

It is suggested that, in the interest of good instruction and as a measure of economy, at each cavalry post a school for training remounts should be established under an officer, with the necessary assistants, selected for skill in training and handling young horses. While in this school horses should be bitted, suppled, gaited to the regulation paces, and accustomed to fire; they should not be turned over to the troops until the officer in charge reports them fit.

Maj. F. Moore, acting inspector general of the Northern district, a distinguished cavalry officer of large experience, says:

I agree fully with the views of the Inspector-General of the Army, expressed in his last annual report to the Commanding General of the Army, as regards the training of remounts; but even after a remount is well trained he should be kept out of the hands of a young soldier. It often happens that a fairly well-trained horse is spoiled by being given to a recruit. The troop commander is responsible for this, and it should be the rule that remounts must be assigned to the older soldiers.

Upon the subject of infantry instruction Major Sanger says:

The attack in extended order merely confirmed the opinion previously expressed by me as to the Drill Regulations on this subject. It may be stated in this connection that the German and French armies, from which the extended order drill of our infantry has been largely if not entirely taken, are by no means satisfied with its adaptability to battle, and seem likely to revert to formations familiar to our armies during the civil war. It is believed that the maintenance of a line of supports formed and disposed as prescribed in our Drill Regulations is not possible under the fire of the magazine rifle. Even at drill it is difficult to carry out the regulations in making an attack, and it is probable that to attempt it under fire, as prescribed, would result in fatal confusion and demoralization. The supports would rush forward to the firing line or be scattered over most of the ground between the firing line and the reserve, where they would fall an easy prey to the far-ranging and deadly bullet of the modern rifle. The whole theory of a regiment of three battalions of four large companies, to be handled as prescribed in our Infantry Drill Regulations, while perhaps adapted to the large standing armies of countries in which every able-bodied man belongs to a company and is more or less instructed in drill, must be, for that reason, unsuitable for any army we are likely to have for years to come. To those who took part in the late civil war nothing could be more pathetic than a volunteer infantry regiment of 2,000 or 3,000 men, composed of companies of 250 men each, the whole commanded by inexperienced officers. During the war the average infantry regiment, after a few months, did not exceed the strength of a German infantry company of the present day, yet its size was quite up to the abilities of many colonels. Again, the squad

system, on which the entire infantry superstructure rests in battle, will find but little favor with the American volunteer, whose courage, intelligence, and self-reliance should have full scope on the battlefield.

Successive deployed lines of attack at suitable distances, no matter by what names they may be designated, offer the smallest target and at the same time the greatest firing front; the companies, battalions, and even regiments can preserve their identity throughout the attack with all the steadying and encouraging influences which this imparts, and can be more easily directed to the front or rear than when broken into such detachments as the books prescribe.

Practical problems.

The reports show that in all of the districts the inspection included the solution of a problem in minor tactics, and in addition to those mentioned in Appendix A the following may serve as samples to indicate their spirit and scope.

North Atlantic district.

The artillery posts of this district were called upon "to make details for the magazine and other accessory service and with the remainder of the garrison to man as many guns as possible to prevent the passage of an imaginary hostile fleet." Lieutenant-Colonel Hasbrouck, acting inspector-general, North Atlantic district, says, "This work was generally well done;" and of the infantry exercises he says, "The normal formations and maneuvers in extended order and the normal types of advance guards and outposts are generally well executed."

South Atlantic district.

In this district the problem given to the garrison of the artillery posts having seacoast batteries was "the defenses of the forts against an attack of battle ships, armored cruisers, and torpedo boats; dispositions to prevent a landing; for the arrangement and protection of the mine field, the service of the magazine and the care of the wounded."

Major Sanger, inspector-general, South Atlantic district, says:

In general, the defects noted were due to a want of proper artillery organization and previous practice; to lack of proper communication between base-end observers and the plotting stations and between the latter and the gun groups, and to faulty positions and direction of base lines and their stations with reference to the batteries.

Concerning the solution of the infantry problem, Major Sanger says:

The problem indicated that the rank and file * * * are very much in need of this kind of instruction, and that some of the officers would no doubt be benefited by more frequent practice.

And concerning the cavalry problem he says:

The problem, * * * while well executed, indicated some carelessness on the part of subordinate commanders in observing the usual precautions when marching in the presence of the enemy.

In connection with the solution of problems in minor tactics within the South Atlantic district, Major Sanger says:

Removing the wounded.

Their skill in giving first aid to the injured and the general efficiency of the Medical Department in arranging for the care and removal of the wounded has been tested. As a rule the officers and enlisted men of the Medical Department appeared to understand thoroughly what was required of them by a proper distribution of the hospital corps, by establishing dressing and ambulance stations and field hospitals, and equipping them with the necessary appliances. In some instances the completeness of the arrangements, the instruction to the hospital corps, and the supervision of the company litter bearers were most satisfactory and could not have been improved. The usual course of such an inspection is for the company commanders, prior to the supposed engagement, to designate from two to four men of their companies to simulate the wounded. At suitable intervals these men fall out and are given fictitious wounds, which are supposed to be dressed, first by the stretcher bearers, who then carry the wounded to the nearest dressing station, where they receive the attention of the surgeon. After witnessing this operation in the three arms of the service, I

am fully satisfied that while occasions may arise when the enlisted men of a company, troop, or battery may be used as stretcher bearers, this duty should devolve on a special body of men having no other duty when an engagement or battle is in progress. It is only necessary to see four able-bodied soldiers, with their arms slung, leave the firing line to carry off a wounded companion in order to appreciate how entirely inappropriate such an arrangement is and how disastrous it may prove in the hour of trial. It would appear that the whole subject of teaching first aid to our Army has been misunderstood and carried to an extent never contemplated. If its object was to convert our able-bodied and instructed soldiers into stretcher bearers, the sooner it is discontinued the better. If, on the other hand, its object is to give our officers and men greater self-reliance in action by teaching them how to help themselves until they can receive surgical attendance, then it is a wise provision, deserving every kind of encouragement.

As under the stress of battle soldiers are very apt to do whatever they have been trained to do in time of peace, and as owing to casualities it will be of very great consequence that no detachments be made from the combatant force in time of action for any but fighting purposes, I recommend that the position and insignia of litter bearer be abolished from the line of the Army and transferred to the hospital corps, with the understanding that during the progress of an action the wounded must lie where they fell, unless removed by the hospital corps, receiving in the meanwhile, from themselves or their comrades, such assistance only as can be given without impairing in any sensible degree the efficiency of the force engaged. It is not, of course, the intention by this suggestion to discontinue instruction in first aid, as now required.

Northern district.

Problems were given to the garrisons at every post within this district, except two of the smaller posts where it was impracticable, and they usually consisted of some phase of the general problem of attack and defense of position, with the usual incidents leading up to it, and suited to the terrain, strength of garrison, etc.

Of the solution of the problem at Fort Riley, Kans., the only post where the three arms were brought into action, Major Moore, acting inspector-general, Northern district, says:

The day on which this exercise came off was so very foggy that it was impossible to see the disposition of the troops. However, I rode along the contact line for some distance, and found the troops properly disposed. The troops at this post have had so much instruction in field exercises that it is impossible for them to be anything but well instructed.

On the solution of problems in general Major Moore says:

At some of the posts the solution of these problems was very good, showing good judgment on the part of the officers concerned. The maps and reports submitted showed care and attention.

Southern district.

In this district problems were given at twelve posts. Those at Forts Sill, Huachuca, and Wingate will be found in Appendix A. The others usually included some form of attack and defense suited to the locality.

COMMISSIONED OFFICERS.

The satisfactory condition of affairs as to harmony and efficiency among the commissioned officers, reported last year, still continues. The high standard of professional attainment is frequently commented upon by inspectors.

It is suggested that the individual service report called for by paragraph 806, Army Regulations, be discontinued, as the report required by the next paragraph can be made to include all the necessary information respecting each officer. It seems to be a policy of questionable propriety to require a man to report upon his own qualifications, and what he has read or studied can be of little practical value unless it has developed him professionally, which will be apparent to his com-

manding officer, who is the proper person to bring the fact to the notice of higher authority.

It is also suggested that copies of unfavorable reports be usually furnished by the commanding officer to the officer reported upon, for his remarks, and these, when received, be filed with the original report, so that all injustice, whether of severity or undue lenience, be avoided, and all sides be fairly heard and recorded for proper official attention.

COMMAND OF POSTS.

The reports as a rule show that commanding officers are able, zealous, and efficient; that the system of instruction prescribed is faithfully observed, and that justice is promptly and legally administered.

Where there have been exceptions extracts have been furnished to the Secretary of War.

Grounds and buildings.

The appearance of the new posts, with carefully constructed and well-laid-out roads and walks and well-built houses, is a great improvement upon the old state of things. The police of grounds and buildings is reported to be very satisfactory. At some posts there still remain old buildings and fences which detract very much from the otherwise neat appearance of the posts; and there is some criticism of the plan and location of buildings, etc.

Discipline and behavior of troops since last inspection.

No serious breach of discipline has been reported during the past fiscal year. The behavior of the enlisted men is generally reported to have been very satisfactory.

Lieutenant-Colonel Vroom, inspector-general, Middle district, says:

The men as a rule are well behaved. The old-time discipline, however, which could be relied upon in any emergency, no longer exists and seems to have disappeared with the passing of the old soldiers.

Lieutenant-Colonel Hasbrouck, acting inspector-general, North Atlantic district, says:

It was noticed that while the salute prescribed by Army Regulations, paragraph 394, was generally given by the younger to the older officers, it was often neglected by officers of the same grade among themselves. I believe that compliance with this regulation would be an important object lesson to the enlisted man in discipline and respect for rank, and would have a beneficial effect.

An examination of court-martial orders discloses a very great disparity in sentences awarded offenders who have committed some breach of discipline. While General Orders No. 21, 1891, Headquarters of the Army, has lessened this evil, had it fixed a minimum limit of punishment it is thought that the practice of courts-martial would be more uniform and better results would ensue. It is therefore suggested that the order be amended so as to fix a minimum as well as a maximum limit of punishment for the offenses therein enumerated.

The guard, guardhouse, and prisoners.

Guards are reported alert, efficient, and well instructed. They have usually been no larger than the situation required. At some posts, particularly in the North and South Atlantic districts, the guardhouses are reported as unsuitable for the purpose. It might be well, if even in garrison, the guard was occasionally mounted properly equipped, ready for the field. This exacting duty should not be treated nor regarded in any particular as wholly a ceremonial function.

Lieutenant-Colonel Hasbrouck, acting inspector-general, North Atlantic district, says:

The sentinel in charge of the general prisoners had his rifle loaded. The principle is correct, for sentinels can not be held responsible for the safe-keeping of

prisoners unless furnished with loaded firearms, but at a post like this, in the midst of a city, the modern rifle is a most dangerous weapon on account of its great range and penetration. For the purpose of guarding prisoners here, I think it would be advisable to issue one or two breech-loading shotguns and buckshot-cartridges. * * *

Some difficulty is experienced in always finding work enough for the prisoners and in keeping them busily employed during fatigue hours. The police of the post furnishes the only constant demand for their services. * * *

Locating criminals among the busy in any avocation of life, whether military or civil, is a matter which has doubtless been given close consideration by experts upon the wisest treatment of the criminal classes.

Field service, practice marches, encampments, etc.

Field service, properly speaking, has been confined to the Department of Colorado. Annual practice marches have been reported as being made by the garrisons of fifty-eight posts. During these marches war conditions have been simulated and the march generally conducted as if in the enemy's country. Advantage has generally been taken of the opportunity to instruct the troops in minor tactics, intrenchments, map making, and hasty sketching, castrametation, field cooking, etc. On this important subject the following remarks are made by the inspector and acting inspector-general.

Lieutenant-Colonel Hasbrouck says:

The infantry would be restricted to short marches for the first few days if unexpectedly turned out of garrison to take the field. They can be accustomed to the marching kit and kept in readiness to carry it by requiring them to make a stated number of marches in heavy marching order every month throughout the year when outdoor work is practicable.

Lieutenant-Colonel Vroom says:

The utility of a practice march of 150 or 200 miles once a year is not apparent. Troops should be constantly practiced in marching, if they are to be at all times ready for field service.

Major Moore says:

* * * This has given rise to well-grounded complaint on the part of some of the infantry officers that the distance is too great for the infrequency of the practice.

I renew my recommendation of last year, that marches of two or three days' duration, monthly, in heavy marching order, without transportation, would accustom the soldier to care for himself and give him that experience so much needed in actual service.

The following table exhibits a summary of the number of organizations, so far as reported, making practice and other marches and engaged in field service, expeditions, scouting, pursuing violators of neutrality laws, etc.:

Arms of service.	Practice and other marches.			Field service.		
	Company organizations.	Miles traveled.	Average per organization.	Organizations.	Miles traveled.	Average per organization.
Artillery	7	1,128.2	161.2	0	.....	.....
Cavalry	72	23,507.2	312.6	13	25,910	1,993.1
Infantry	120	21,262.6	177.2	7	7,448	1,064
Army	199	45,898	230.6	20	33,358	1,667

Considerable field service was performed by detachments. The Seventh Cavalry, in the Department of Colorado, seems to have been the most actively engaged, its troops and detachments covering a total distance of some 19,000 miles.

The reports as to practice marches are not as full as desired in some respects. There were some 28 artillery and 39 infantry organizations (not included in the table) reported to have made them, but the distances covered were not given. In practice marches the Eighth Cavalry and Second Infantry led in their respective arms, the former covering a total of 4,532 and the latter of 2,687 miles.

Annual course of instruction in drills, tactics, hasty cover, etc.

In all the departments except one the orders required by paragraph 230, Army Regulations, have been published, and are very comprehensive in their scope, covering in an excellent manner the entire field of practical and theoretical instruction of troops. If these orders are enforced with spirit and intelligence, the state of efficiency developed will place the troops of the United States Army upon a plane never occupied by it in previous times, as far as instruction goes.

In the Department of the East, except at Fort Monroe, the course of drills, etc., was prepared by the commanding officers, by direction of the department commander, to whom plans were subsequently sent for approval.

Upon this subject Major Sanger, inspector-general South Atlantic district, says:

In January, 1897, Department General Orders No. 3 was issued, under paragraph 230, Army Regulations, prescribing the annual instruction of the artillery troops in drills and in problems of seacoast defense. This order was very much needed, as the artillery post commanders in the South Atlantic district, with but one exception, had not organized or instructed their commands with a view to proper fire discipline, or, in other words, the direction and control of the fire of the armament by the post commander. In this connection I desire again to invite attention to General Orders No. 108, Headquarters of the Army, 1888, and to the fact that the system of squares and the method of locating objects on the water by polar coordinates restricted to square centers has no practical application in the South Atlantic district. This system was tentative and was established because no other system was considered practicable at that time. It has never been generally observed, notwithstanding the orders, or exhaustively tried at any post; and whether it is better adapted to the actual conditions of artillery defense than the system now observed at a majority of artillery posts can not be answered in the light of experiment. Stated briefly, it consists of locating objects by means of the squares into which, by the order referred to, the harbor charts are divided. Tables showing the azimuth and distance of the square centers from each gun are prepared, the traverse circles of the platforms are graduated in azimuth, and before observing the object the instruments at base ends are set up in azimuth. As soon as the object is plotted the number of the square on which it is found is telephoned or signaled to the gunner, who aims his gun at the center of that square by means of his azimuth and range table and graduated traverse center. While answering fairly well as an experiment with the old armament, this system was not without many apparent objections which became more manifest with the introduction of the high-power guns. These objections were the large charts and great number of squares required to cover the field of fire, the labor of preparing the azimuth and range tables, the time lost by the gunner in consulting them, and the error between the plotted position of the object and the point aimed at.

For the purpose of devising something more accurate and not open to these objections, a board was appointed by the Secretary of War October 24, 1890, on the recommendation of the major-general commanding the Army, to test the range and position finders, and on November 20, 1894, a second board to devise regulations for the control of seacoast artillery fire. As soon as the result of their investigations and experiments became known to the artillery, so much of General Orders No. 108 as prescribed the square system fell into disuse at a majority of our artillery posts, and the system, which is believed to have received the qualified if not the full approval of these boards was attempted, without, as far as can be learned, any other authority than the intelligent conviction on the part of the artillery that it was better than the one prescribed. The fundamental basis of the system, as stated by the board, is the practical application of the general principal of polar coordinates by the use of range finders and the conversion of the azimuth and range, as determined by them, into corresponding coordinates referred to the position of the gun as a center. This is done by a relocator or converter, and is said to give more accurate results, in less time, than the other system. It certainly is more accurate, mathematically speaking, and obviates the necessity of platting and tabulating

squares and the preparation of the azimuth tables. I have not had an opportunity of forming a definite opinion as to the relative merits of the two systems in all their bearings, but as far as I am able to judge the latter system is the better, and at all events is the only one in practical operation to-day, and for this reason had better be authorized. If this is not deemed advisable, then the execution of General Orders No. 108 should be insisted on at all artillery posts, so that we may have some system of artillery firing which shall be observed by the entire body of artillery.

In other respects the instruction of the batteries of artillery stationed at seacoast posts having an armament answers very well, but does not comply with the Manual of Heavy Artillery, which requires practical instruction in tracing and profiling earthworks, in preparing auxiliary means of defense, such as fascines, gabions, wire entanglements, abatis, etc.; building traverses, magazines, bomb and splinter proofs, land mines, or torpedoes; mantelets, and finally submarine mines. At no post, save the Artillery School and only to a very limited extent there, are the foregoing duties taught practically. This is especially true of submarine mining, which in all human probability will devolve largely on the artillery. Hence they should have practice in planting the mines, preparing the fuse, making the electric connections, and, in fine, performing practically every operation which the service requires. To this end I recommend that at least one torpedo case of each kind, with anchors, chains, etc., complete, be provided for every seacoast post garrisoned by the artillery.

As for the other matters of instruction, it seems to me that too much time is spent over theory and not enough given to practice, and even in the latter domain the tendency has been to go to extremes, as in the matter of cordage, for example, where men are taught the mechanism of knots they will probably never use. This may be attributed largely to the annual battery competitions for qualified gunners and the requirements of existing orders and the artillery examining boards.

It is well enough to teach all the enlisted men the how, but not always or even generally necessary to teach them the why, and it is in the attempt to do the latter that the time and patience of teachers and pupils are exhausted. Any man of ordinary intelligence can be taught how to read a vernier or to use a range finder or a breech sight without knowing a single principle involved in their construction; and yet so much time is consumed in trying to teach the theory to a few men that a majority of the rank and file of each battery do not know even the necessary nomenclature of the guns, carriages, implements, etc., and very little about sighting guns. A rearrangement of the course of artillery instruction which will result in teaching most of the men a few essential subjects, and possibly the sergeants the more abstruse subjects, would greatly improve the general efficiency of the artillery. Infantry drill, except as prescribed in paragraph 10, Manual of Heavy Artillery, should be suspended whenever the batteries are serving as artillery.

Finally, it is most important that the garrisons of all our seacoast forts should be organized for seacoast defense and that the chain of command and every accessory thoroughly tested by frequent practice—say once each month. This project, having been carefully prepared, should be written out in all its details, entered in a book, and retained in the personal possession of the post commander for the information of his successor, who would thus have at hand all information necessary to the efficient command of the post.

At several of the posts where light batteries of artillery are stationed the limits of the reservation make it impossible to cover the scope or reach the perfection contemplated by the drill regulations and orders. It would seem to be the part of wisdom to station these batteries at points where every facility of terrain, space, range, etc., would be available. This arm of the service, except those batteries having had the advantage of station at Fort Riley, threatens to lag from lack of opportunity relatively behind the other arms in point of practical instruction in firing.

General Orders, No. 53, Headquarters of the Army, 1896, has proved to be of great benefit in the matter of practical instruction, in that it has brought about uniformity in method; and it has given to the system of inspection a needed support and impetus as well as developed the state of practical efficiency for actual service under these orders and the approval of the commanding general. The varied character of the duties inherent to this department, bringing it nearly to the inmost courts of duty of all the other military branches of the Army, require from its officers a special vigilance, skill, and experience, and it is very essential, therefore, for the efficiency of the service and the economy of

its administration that the duties required from these officers should be fairly sustained and encouraged, that they may be performed with a confident completeness and thoroughness that will satisfy every requirement.

Hasty cover.

There is, in places, a tendency to neglect practical instruction in hasty cover. It would probably receive more attention if a practical intrenching tool were devised and made part of the soldier's equipment; the knife bayonet does not appear to be wholly satisfactory in the rôle of intrenching tool; as a knife it might well be lighter, or as an intrenching tool be different. The passing of the triangular bayonet may appear slow and difficult; and the present one is possibly but one step in the evolution of the best one to meet future demands.

Athletics.

The subject of physical exercise has received careful attention in all the departments. Orders have been issued prescribing courses of training and establishing field days and departmental competitions. Much interest has been developed in this field, which has now become a prominent feature of the soldier's education.

The work is seriously handicapped for want of properly equipped rooms or buildings. Each permanent post should be provided with a well-equipped gymnasium.

Readiness and condition of the commands for both field and garrison service.

Most of the garrisons seem to be ready for any service likely to be demanded, and the proper authorities are constantly giving this soldierly readiness for emergencies the closest attention. The fortifications along the seaboard are at last assuming a condition of defensive and offensive use by their garrisons.

GENERAL MESS.

At the new posts recently established the barracks are provided with company kitchens, and it is understood no more mess halls are being constructed. At several of the larger posts having large mess halls and no facilities for messing in barracks the post mess is still maintained.

The food furnished is generally reported excellent in quality and sufficient in quantity.

POST LYCEUMS AND SCHOOLS FOR OFFICERS AND NONCOMMISSIONED OFFICERS.

Lyceums and schools for noncommissioned officers have been carried on as prescribed in Army Regulations, supplemented in some instances by orders from department headquarters.

On this subject Lieutenant-Colonel Vroom, inspector-general, Middle district, says:

A commendable degree of interest in the work of the lyceums is reported to have been manifested. Some modification in the work of the lyceums is, in my opinion, necessary. * * *

Major Sanger says:

It is suggested that before discussing other subjects our artillery officers prepare plans of defense of the several artillery posts and the harbors in which they are located as a part of the lyceum course.

Major Moore says:

The noncommissioned officers' schools should have a prescribed curriculum. The course is now practically optional with company commanders, and only the more enterprising extend it to subjects beyond the most ordinary. I think that reconnoissance, with map making, etc., should be taught to all noncommissioned officers.

THE SPECIAL SERVICE SCHOOLS.

Necessarily these schools are the intellectual center of much of the best work in their respective arms. The main difficulty experienced in operating these schools is the lack of sufficient funds, and it is urgently recommended that an effort be made during the next regular session of Congress to secure an adequate appropriation. Their great importance to our military interests should render such schools objects of special solicitude to the Government. They rank well among the similar schools of the world, and their instructors are quoted at home and abroad as eminent authorities on their special subjects.

The attention it deserves may have already been given to the occasional repetition of identically similar studies instead of having the instruction at our several institutions so coordinated that student officers could beneficially attend more than one school without wasting time duplicating studies. The military studies and exercises which are generally considered necessary in all armies as a preparation for general staff work should be carefully developed and required at one of them, and the practical exercises with the three arms should be possible, and officers of all arms might be offered adequate opportunity to practice and master them. The results from these institutions show how important the founding of a good school is and what reproach should visit the destroyer of one. The efforts to elevate and improve the course of study have been so recent and successful that confidence is given that all future demands will be adequately met. The local desire is certainly equal to the need for wise modification or extension of the curriculum.

SMALL-ARMS TARGET PRACTICE.

Small-arms target practice has been held this year by all organizations except twenty-three. The sights of the small arm invite much criticism. Though it is rather early for comparison, the results with the new weapon are said to be improved at known distances and not so good as yet in skirmish runs. A new illustration was given at the National Guard camp in southern California this year of what efficient instruction in firing can be given by practicing its proper principles, even without a great expenditure of ammunition.

Major Moore, acting inspector-general Northern district, says:

> Two months in the best season of the year is entirely too much time devoted to instruction in target practice. I think the Firing Regulations should be modified in this respect. I know from practical experience that one month is sufficient for cavalry, including the revolver practice, in which to give careful training and exhaust the authorized allowance of ammunition. Then why waste another month of the training season, which could be devoted to other equally necessary instruction? This particularly applies to the northern posts, where the season is short, and also more particularly to the mounted arm, in which absolute precision is not so essential. There would be no objection to two months when one half of the command was devoting itself to drilling and training and the other half to target; but as it is now generally used the two months are frittered away waiting for the wind to go down, and other excuses. Let us have one month only, or, when the command is large, two months, with one half the command training in other exercises while the other half is engaged in target practice.

ARTILLERY TARGET PRACTICE.

This practice has been conducted as prescribed, but at known and usually short distances, and stationary targets only. Under the pressure of economy and for the sake of the fullest attainable experience, a desire

for subcaliber practice has been expressed by the more progressive officers on a similar principle to gallery practice for small arms; but the means are not yet furnished. With the National Guard opportunity is offered in their splendid armories for dummy practice with models of artillery as well as gallery practice with small arms.

Lieutenant-Colonel Hasbrouck, acting inspector-general, North Atlantic district, says:

> The system of practice now in vogue for the heavy artillery gives good training in laying individual guns. For training in technical firing, in the control and direction of the fire of several groups of batteries that constitute a modern sea-coast command, subcalibers seem to be absolutely necessary. With subcaliber rifles throwing cheap cast-iron projectiles of an inch or inch and a half in diameter and giving a splash easily discernible at the range of a mile or two, frequent and inexpensive practice could be held against a number of targets, either anchored or floating with wind and tide, and the command exercised in the distribution and concentration of the fire of the different groups. Practice could be held over waters where it would be impossible to fire the service guns, and would train the garrison and test all the accessory services in everything to be done in war except the handling of ammunition. A couple of subcalibers for each group of guns would be sufficient. They would be light and easily handled and might be sent from post to post for use.

In the matter of instruction of field artillery, Lieutenant-Colonel Hasbrouck says:

> Firing the annual allowance of ammunition at fixed targets over one or at most two or three ranges, selected by the captain himself, and which he may be fortunate enough to secure during the practice march, is better than no firing at all; but it is very elementary. A suitable practice ground which would afford opportunities to exercise judgment in the selection and practice in the occupation of positions in battery, and a number of safe ranges, are necessary to train this arm for duties in war. The captains should not know beforehand the targets to be fired at. These should be prepared without his knowledge and pointed out to him at the moment of coming into action. As soon as the range of a target is found, fire should be limited to the few rounds sufficient to show its efficiency, and than a new target should be designated. The difficulty in field practice is to determine quickly the right elevation and length of fuse. After these are found, hitting the target is a simple matter. A series of targets arranged to appear and disappear can represent an enemy advancing or retiring, his different positions, and the varying phases of a fight. The European field artillery have such facilities for their practice, and we can not expect to cope with them on equal terms unless we possess them too.

COMBINING ARTILLERY POSTS.

Perhaps the unwisdom of ships fighting independently without regard to the due cohesion of the fleet and its attack, is no more marked than to have the forts disregard the strength given by combination for the defense. In preparing to practically meet the problem of coast defense, while the distinct forts are being placed in a state of complete readiness, consideration is also due to the exigencies involving more than one neighboring garrison; but this broader view and control may need fuller recognition than formerly given.

MOVABLE TARGET.

Years ago both the marksman and target were expected to be stationary, and the men were only expected to hit when everything was perfectly favorable. The skirmish runs were a great improvement; but to simulate battle conditions both marksmen and target must be expected to move, or even appear unexpectedly, and this should be recognized both in gallery practice and in the open. We need compulsory practice and battle conditions both for cannon and small arms, and the movement in that direction is at last culminating in practical results.

POST SCHOOLS.

Post schools are maintained at all garrisons, and about as many men attend them as compose four infantry regiments.

Major Sanger, inspector-general, South Atlantic district, says:

But little over 12 per cent of the men attended the post schools, and of this number only 3 per cent were voluntary attendants.

The subjects taught at all posts have been reading, writing, arithmetic, geography, history, and spelling. At Washington Barracks the higher mathematics and physical sciences were taught to a few pupils. At this post certificates of proficiency are given those who complete the different courses successfully, and have proven an incentive to study. This should be done at all post schools, under War Department orders, the certificates being classified according to the requirements of the schools and attainments of the pupils. While progress in elementary instruction has generally been good with the younger men, but very little has been done with the older soldiers.

And in a special report on this subject he says:

Of 23,780 enlisted men composing the garrisons of the posts inspected during the year, about 2,000, or a fraction over 10 per cent, attended the post schools. The inspectors report a general lack of interest on the part of the officers and enlisted men, and as there are but very few instances of voluntary attendance, the total number of pupils reported—to wit, 2,000—includes all who need or desire instruction. (See par. 318, A. R.)

Doubtless the attendance would have been larger at most of the schools were the instruction more military in character, for there is no doubt but that many enlisted men refuse to attend the schools as at present administered from fear of ridicule or of showing their ignorance of elementary subjects. Decision No. 2 in circular 1, Headquarters of the Army, of 1891 was no doubt intended to remedy this defect by varying and raising the character of the instruction; but, except at posts where the commanding officer has been an enthusiastic believer in the school and the officers and enlisted men have been ordered to attend, even the proposed variation from the common English branches has been difficult, and where possible by no means successful, if the interest of the officers and enlisted men may be taken as a criterion.

The effect of section 2 of the act of Congress approved August 2, 1894, regulating all future enlistments and reenlistments in time of peace, will no doubt be to entirely eliminate from the Army the ignorant element whose educational deficiencies resulted in the enactment of section 1231 Revised Statutes in 1866; and while this section should remain on the statute books to provide for future contingencies, as well as for the education of the few enlisted men who need it, the maintenance of the post schools for this purpose alone seems no longer necessary or advisable. I therefore propose that they be given the character of military schools, intended more for the professional advancement of the enlisted men than their education in the common English branches. This is entirely feasible and proper under Article XXXVIII of the Army Regulations, and will go far toward the education of our soldiers in their duties, and will do away, it is believed, with the objection which so many enlisted men now have to attending the post school.

There is one other point to which attention is invited. The act approved July 30, 1892, repealing sections 3 and 4 of the act approved June 18, 1878, providing for the promotion of meritorious noncommissioned officers, authorizes private soldiers of no less than two years' service, etc., to compete for promotion. Under this act numbers of young men are now entering the Army for the express purpose of obtaining commissions. Whether it was in the interest of discipline to thus ignore the grade of noncommissioned officer as a necessary step in the promotion of enlisted men, time will probably determine; but as the only schools established under the regulations are for the professional instruction of noncommissioned officers (see par. 230, A. R.) it would seem that some provision should be made for those who, while they have the intellectual and educational attainments for appointment, are lacking in military instruction and experience. In fact, those who need detailed instruction most, receive the least attention under the regulations at the hands of the officers; and while I do not favor in the least such association between the officers and enlisted men of our Army as prevails in the armies of countries where class distinction is a perpetual safeguard and barrier against undue familiarity or a weakening of discipline, I am quite sure that the discipline of our Army would be vastly improved were the officers to become the instructors of the rank and file as herein proposed.

PLAN.

The post school should be placed in charge of a field officer when practicable, otherwise of a captain, who should be known officially as the superintendent of the post school.

All officers and all enlisted men of the line should be members of the school, and should perform such duties as may be prescribed.

The enlisted men should form four classes, as follows: First class, noncommissioned, staff officers and sergeants; second class, corporals; third class, musicians and privates; fourth class, musicians and privates.

Each class should be divided into as many sections as may be necessary for thorough instruction, and the latter should be in charge of commissioned officers as instructors.

Each section should recite for one hour daily, and the standing and proficiency of the pupils should be determined by marks given by the instructor on a scale of ten.

Those pupils who complete the course of their grade and whose average mark for the course, including the annual examination, is not less than seven, should receive a certificate of proficiency. Conduct and neatness should be considered in determining proficiency, and hereafter no private should be promoted to corporal and no corporal to the grade of sergeant without having received a certificate of proficiency in the lower grade.

The names of those receiving certificates should be published in orders from the headquarters of the Army or of the Department.

The school term should continue during the four months of the calendar year when the outside drills would be suspended or most interrupted on account of the weather, and should be announced in orders by department commanders.

Major Moore, acting inspector-general, Northern district, says:

The post school has been practically abandoned by the soldier, but its usefulness still survives in the instruction of the children of the posts, who are liberal attendants at all stations not convenient to public schools.

Post schools—Session 1895–96.

Inspection districts.	Average strength of garrisons.	Pupils.		Teachers.			Percentage of attendance to average strength of garrison.
		Average daily attendance.	Number of volunteer pupils.	Commissioned officers.	Enlisted men.	Total.	
North Atlantic	3,440	556	.....	.....	28	28	16.2
South Atlantic	2,358	301	92	20	13	33	12.8
Middle	3,200	367	45	5	30	35	11.5
Pacific	2,756	131	10	1	21	22	4.8
Northern	4,810	296	.....	7	31	38	6.2
Southern	3,464	146	.....	6	26	32	4.2
Total	20,028	1,797	147	39	131	188	.....
Average per district	3,338	299.5	49	7.8	21.8	31.3	9

GENERAL POST AVERAGES.

North Atlantic	245.7	39.7	.....	.....	.....	2	16.2
South Atlantic	262	33.4	10.2	2.2	1.4	3.7	12.8
Middle	400	45.9	5.6	.6	3.7	4.4	11.5
Pacific	250.5	13.1	.....	.....	2.1	2.2	5.2
Northern	370	22.8	.....	.5	2.4	2.9	6.2
Southern	288.7	12.2	.....	.5	2.2	2.7	4.2

The following summary, pertaining to lyceums, post schools, libraries, etc., for the past fiscal year, has been compiled from the data received on the subject. How nearly this compares with the opportunities and the work done in the past may be worthy of attention. The libraries have been enduring a very damaging experience in recent years. The post schools still show, in addition to the company schools, over 2,000

men, or an average of over 28 men attending at each post; though at some posts the teacher is paid while giving little or no instruction as compared with the successful ones.

Department.	Number of posts.	Lyceums.			Post schools.					Libraries.		
							Attendance.			Volumes.		
		Essays read.	Average per post.	Average per company.	Enlisted men at posts.	Average school days per post.	Per cent.	Total for department.	Average per post.	Average per company.	Number.	Average per post.	Average per man.
East	24	323	13.5	3.23	5,847	.....	16.4	960	40	9.6	b15,832	b753.9	b3.3
Missouri	9	151	16.8	2.44	4,128	.....	6.3	259	28.8	4.2	4,989	554.3	1.2
Dakota	8	103	12.9	2.71	2,370	.....	8.1	192	24	5.1	8,748	1,093.5	3.7
Platte	6	94	15.7	2.24	2,481	93.3	5.3	132	22	3.1	5,067	844.5	2
Colorado	9	97	10.8	2.02	2,942	62.9	10.3	302	33.6	6.3	6,945	771.7	2.4
Texas	6	79	13.2	2.93	a1,644	a74	a3.3	a55	a7.9	2	a6,078	a868.3	a3.7
California	6	62	10.3	2.82	1,465	72.8	8.1	119	19.8	5.4	3,839	639.8	2.6
Columbia	6	62	10.3	2.95	1,545	68.5	5.8	90	15	4.3	.....	.....	.....
Total	74	971	13.1	2.7	22,422	73.3	9.4	2,109	28.1	5.9	51,498	780.3	2.6

Department.	Number of posts.	Libraries.			Reading rooms.					Children's schools.				
		Circulation.			Papers and magazines.			Attendance.		Posts maintaining.	Children of school age at these posts.	Attendance.		
		Number.	Average per post.	Average per man.	Number.	Average per post.	Average per man.	Average daily.	Per cent.			Per cent.	Total for department.	Average per post.
East	24	c2,627	c154.5	c0.68	d555	d24.1	d0.10	e840	e16.4	4	123	22.8	28	7
Missouri	9	a8,818	a1,259.7	a2.35	137	15.2	.03	f302	f7.6	6	204	52	106	17.7
Dakota	8	a6,674	a953.4	a2.97	125	15.6	.05	a269	a12	5	121	75.2	91	18.2
Platte	6	3,680	613.3	1.48	106	17.7	.04	234	9.4	4	102	61.8	63	15.7
Colorado	9	7,252	805.8	2.46	229	25.4	.08	609	20.7	6	122	63.9	78	13
Texas	6	3,316	552.7	2.10	a69	a9.9	.04	213	13.5	1	30	66.7	20	20
California	6	.....	.....	.....	77	12.8	.05	g101	g18.8	2	34	67.6	23	11.5
Columbia	6	.....	.....	.....	.....	.....	.....	.....	.....	2	50	76	38	19
Total	74	32,367	622.4	1.92	1,298	19.4	.06	2,568	13.6	30	786	56.9	447	14.9

a 7 posts. b 21 posts. c 17 posts. d 23 posts. e 20 posts. f 8 posts. g 4 posts.

Since the enactment of the law in 1894 requiring recruits to be able to read and write, the school attendance has decreased some 30 per cent, but it seems the field of instruction has been widened; and the study of somewhat advanced mathematics and other branches and greater voluntary attendance at many schools may indicate the drift of opinion and beneficial expansion of which these institutions are capable if properly conducted.

Except at posts not accessible to public schools, the school for children could be abandoned.

RECRUITING OFFICERS AND RECRUITS.

Many of the organizations are maintained principally by local enlistments. The mental, moral, and physical character of the accepted applicants are reported good, and decidedly improved under the new system.

Attention is invited to the following extract from the report of Major Sanger, inspector-general of the South Atlantic district:

Two methods of handling the recruits on their arrival at posts prevail in this district. Under one system the recruits are assigned to companies as soon as received; under the other they are kept apart under the supervision of an officer until sufficiently instructed to perform duty. I believe that where a suitable officer is available for this duty the latter plan should prevail at all large posts, and whenever large detachments of recruits are received at any post. Assisted by even-tempered, intelligent, and capable noncommissioned officers, the officer is able to give a thorough course of training in the school of the soldier, guard duty, and the rules of courtesy, including the parts of the Soldiers' Hand Book which should be taught every recruit. When assigned to companies immediately on arrival the instruction of the recruit is often interrupted, or, if not, is imparted by anyone, apt or inapt, who may be available for the purpose. As a result, the instruction is not thorough and the attributes of the recruits not well understood. Again, under this system, they are the fags of the company, being called on for all kinds of fatigue. In some companies this idea becomes paramount, and when carried out with a certain amount of rough treatment soon convinces the average American recruit that he has made a mistake, which, as it can not be rectified by him, he avoids by deserting. After a few months, when, under the other system, he has become accustomed to his surroundings and overcome all feeling of homesickness, he takes a very different view of his life, and looks with indifference or amusement on successive recruits as they learn their paces or respond to the peremptory and sometimes ill-tempered orders of those over them.

QUARTERMASTER'S DEPARTMENT.

The supplies furnished by the Quartermaster's Department are reported generally satisfactory. There is still some fault found with the quality and allowance of gauntlets for mounted troops. Campaign hats and leggings have not always been of uniform color.

A lighter steel shoe for cavalry horses has been recommended.

The care of animals, harness, and wheel transportation is reported to be good; except in a few cases, vehicles are still exposed to the elements from lack of sheds and buildings.

Colonel Burton, inspector-general, Pacific district, suggests:

The allowance of straw for bedding for public animals is inadequate. The grain allowance in garrison for troop and light-artillery horses is more than sufficient, while the hay allowance is short. Post commanders can reduce the forage allowance, and often reduce the grain allowance, but can not increase the hay allowance. I suggest that the Regulations be changed to permit troop and light-battery commanders, whenever the duty is not arduous and in their judgment the animals will be improved by increasing one and decreasing the other component of the ration, to take a proportional amount of hay, according to the cost of hay and grain, in lieu of grain. The allowance for straw should be double the amount now allowed.

Tentage.

There is some complaint on the part of company commanders that the present allowance of tentage is not sufficient under all circumstances, and it is suggested that the character and exigency of the service should enter as a factor into the determination of the allowance of tentage. In a permanent or semipermanent camp, such as target camps, etc., more tentage is required and allowable than on a march, where transportation is limited and considerable expensive hauling is necessary. In marching through settled communities, tents are required for purposes for which they are not needed when marching over the prairie; and there are many occasions of mere instruction in times of peace that a more comfortable allowance is permissible than may be possible in the rough exigencies of war, to which all good soldiers readily conform. Perhaps there is no greater need in the training of an army than that all should assemble habitually under war requirements; but this does not forbid ordinary comforts either in garrison or camp at other times.

Allowance of quarters.

It is respectfully submitted that the smallest present allowance of quarters is not sufficient for gentlemen, and no officer willingly restricts himself to such ridiculous limits as one room and a kitchen, so as to mix living, eating, and bedroom into one; and practically the so-called allowance means a fine of several hundred dollars per annum to every man whose orders require him to hire quarters. It is therefore respectfully recommended that, at least for company officers, Congress authorize the Secretary of War to regulate this allowance more equitably.

Possibly an extended argument might be made for this, but a sense of justice and mercy seems to indorse it, and may be all that is necessary to win favor for it. Practically the so-called allowance is less than is allowed some college boys nowadays, and is unseemly for professional gentlemen. Evidently the law has lagged far behind the progress of the times, and is not sustained by public opinion nor the private opinions of the Congressmen. Congress has repeatedly passed appropriations for constructing posts with an allowance of quarters not so humiliating; and it is time this allowance should be applied equally to all officers, whether residing at a military post or not. The restrictions as to the number of rooms allowed, being no longer enforced, should be abolished.

Allowance of baggage transportation.

Change of station in our great country is one of the most trying experiences of our officers. Such moves are made at the will of the Government, and all reasonable expenses should be met by it. That favored officers get concessions may not be an actual economy or desirable arrangement for the Government. Equal and necessary privileges to all is the just and wise policy.

The present allowance of baggage is ludicrously insufficient for the requirements of gentlemen, and army officers are expected to be gentlemen; and there need be no lack of consideration for their families. Measuring the transportation allowance by the pound seems out of date when the average railroad cost per pound per mile in a long haul is something like thirty-three hundred thousandths of a cent ($0.00033), as it is less than a cent a ton per mile.

It is submitted that either by weight or measure a second lieutenant be allowed 2 tons; first lieutenant (as all have served five years at least), 4 tons; captain (they have generally served over twenty-five years), 6 tons; field officers, 8 tons; and the Government need not order any more officers to change station than it can afford to. Perhaps no item needs more careful attention than the cost and methods of transportation, and the distinction deserves clear recognition between the excessive expense of changing station and the comparatively comfortable travel on temporary duty. Great improvement has been effected, and more seems needed.

SUBSISTENCE DEPARTMENT.

The quality of the subsistence stores is generally reported to be excellent. It has been suggested that family flour in 25-pound sacks be kept for sale and rock salt be kept for issue to cavalry troops in garrison.

The evident intent of the law of July 28, 1866, is to furnish the troops everything they need as fully as the sutlers did, and with as much consideration for their wishes and necessities; and it is a pleasure to heartily cooperate in accomplishing this. The considerate and generous

spirit which pervades the law can wisely be displayed in its administration without incurring any undue expense. Evidently the law contemplated credit as well as cash sales, and the volume of sales has possibly been considerably decreased by preventing them. The complaints at posts are, if possible, less concerning post exchange than commissary stores.

In this connection a comparison of sales by the subsistence department with those of post exchanges may not be uninteresting. The following table exhibits the sales of each for the periods indicated, and indicates the subsistence sales are over $200,000 less than nine years ago:

Years.	Subsistence department.				Exchanges.
	To officers.	To enlisted men.	Not previously reported.	Total amount.	
1888	$372,818.22	$430,521.80	.....	$803,340.02	.....
1889	356,349.56	436,639.08	$18.46	793,007.10	.....
1890	332,243.70	438,721.82	259.53	771,225.05	$984,109.07
1891	323,894.94	450,369.66	.....	774,264.60	1,194,060.36
1892	306,212.29	451,980.55	2,991.58	761,184.42	1,383,310.57
1893	312,438.82	434,997.38	2,434.74	749,870.94	1,461,062.82
1894	290,906.35	425,867.01	2,750.58	719,523.94	1,487,448.63
1895	287,790.55	350,788.64	7,428.90	646,008.09	1,518,455.94
1896	255,354.66	328,961.86	1,847.44	586,163.96	1,513,829.52

Whether in any way caused or increased by the difference in business methods and facilities of purchase, it seems a steady decrease of the totals of commissary sales has been in progress and increase of the sales of the post exchange, which have outstripped the commissary, though it is at a profit from the soldiers of $349,154.28, or about 30 per cent. What complications have occurred, and which of the two methods of business and supervision is most conducive to good order and military discipline, have more than once called for attention.

MEDICAL DEPARTMENT.

The Medical Department seems to be generally in excellent condition. The Hospital Corps has frequently been specially mentioned for excellence in appearance and efficiency.

ORDNANCE.

A marked improvement is reported in the care and condition of the armament and ordnance stores of the seacoast forts, and of the ordnance storehouses generally. The armament of all the posts, except those on the seaboard, seems to be complete except as to ammunition for small arms.

The stores and supplies furnished during the year have generally given satisfaction. Minor defects have been developed and reports thereon made to the Chief of Ordnance.

The new carbine scabbard has been very favorably received by the cavalry, though there is a difference of opinion as to which side of the saddle it should be attached.

In the cavalry, and to some extent in the artillery, there appears to be a growing sentiment in favor of fair leather horse equipments. It is suggested that a sufficient number of saddles, bridles, etc., of this material be manufactured and issued for trial.

At many posts and arsenals there are quantities of old, useless, and

obsolete ordnance and ordnance stores, which are a nuisance and a burden to those who have to care for them. It would seem to be good policy to have them condemned and distributed or disposed of.

In this connection Lieut. Col. H. C. Hasbrouck, acting inspector-general, North Atlantic district, says:

There is a great deal of obsolete ordnance material at nearly all the artillery posts, for which there is no further use. I think it ought to be turned into depot and disposed of. Its presence entails much labor on the part of small garrisons to keep it in order and in good appearance. It is of no use, but if ignored it sets a bad example of neglect in the care of public property.

Col. G. H. Burton, inspector-general, Pacific district, also reports:

At Benicia Arsenal there is parked and exposed to the weather a large quantity of old, obsolete, and rotten field carriages. I have recommended on two different occasions that this material be either sold for scrap iron on it or, if it will not sell, to be burned. It can never be more valuable than it is at present, but it is growing less valuable every year through rust. The whole mass of this material is an eyesore. It consumes space which could be utilized and its presence is annoying to the commanding officer. There is a large amount of round shot and some old guns at the arsenal and at Fort Point that can never be utilized except for ornamental purposes. I suggest that the shot not now in use at the station named and as many old guns as may be desired be sent to permanent posts for ornamental use around parades, flagstaffs, etc.

Armament.

Inspection districts.	Field guns.	Machine guns.	Siege guns.	Howitzers.	Rifled sea-coast.	Smoothbore seacoast.	Mortars.					Total.
							Coehorn.	Siege.	Seacoast.	Field.	Breech-loading.	
North Atlantic	267	19	24	86	42	457	11	38	18	6	17	985
South Atlantic	55	24	41	10	69	182	9	35	11	1	.....	437
Middle	24	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	26
Pacific	40	21	2	3	23	36	8	6	16	.....	.....	155
Northern	55	21	.....	.....	.....	.....	.....	.....	.....	.....	.....	76
Southern	36	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	52
Total	477	103	67	99	134	675	28	79	45	7	17	1,731
Average	79.5	17.2	.....	.....	.....	.....	.....	.....	.....	.....	.....	288.5

Upon the subject of the appointment of ordnance-sergeants Lieutenant-Colonel Vroom says:

The age limit (45 years) imposed by Army Regulations, paragraph 91, upon applicants for the position of ordnance-sergeant works a great injustice to many deserving noncommissioned officers. Other post noncommissioned staff officers are appointed regardless of age, and, considering the character of the examination prescribed in Army Regulations, paragraphs 95 and 96, for applicants for post noncommissioned staff appointments (including ordnance-sergeants), the object of the age limit is not apparent. It certainly debars from well-merited promotion some excellent noncommissioned officers who are in every way fully competent to perform the duties of ordnance-sergeant. I recommend that the age limit be abolished.

And Major Sanger says:

After long experience as an artillery officer, and some as an inspector, I venture to suggest that ordnance-sergeants be appointed from sergeants of artillery and not from sergeants of the cavalry or infantry. In the course of my inspections I have frequently found ordnance-sergeants who did not know, and were too old to learn, the names and uses of the many different articles (upward of a thousand) in their charge, and who were entirely ignorant of their proper care. By reserving for meritorious sergeants of infantry and cavalry all vacancies in the grade of post quartermaster-sergeant and post commissary-sergeant, and fixing the number of ordnance-sergeants so that they shall not exceed at any time the number of posts, the three arms would be sufficiently provided with noncommissioned staff appointments,

although the proportion would not be the same. If ordnance-sergeants appointed from the infantry and cavalry could always be assigned to infantry and cavalry posts, the evils resulting from the present system of appointments would be somewhat mitigated, but probably this is not practicable, and therefore the only way to insure to each of our fortifications thoroughly qualified ordnance-sergeants is to take them from the artillery. The importance of this subject will grow with the change in the armament, and it will be unreasonable to expect efficient ordnance service with sergeants of infantry and cavalry, who, as a rule, are entirely unacquainted with guns, carriages, and the tools, implements, equipments, machines, and ammunition necessary for their service and for keeping them in repair. This knowledge only comes by absorption after long years of actual service, and can be acquired by the average enlisted man in no other way.

SIGNAL SERVICE.

Signaling has been practiced at all the posts in compliance with the regulations. The signal stores are in good order, but not as complete as could be desired. At the artillery post, especially, telephones, etc., are required for target practice and rapid communication between the central plotting stations, the base ends, and the gun groups.

VETERINARY SURGEONS.

The veterinary surgeons appear to be efficient and attentive to their duties.

There is a demand for the revision of the veterinary supply table. Attention is invited to the following extract from the report of Major Moore:

The supplies now furnished are inadequate where veterinarians are stationed. One grain of eserine, administered hypodermically, replaces a quart of oil forced down a horse's throat; a few grains of cocaine replace five or six assistants, with ropes, hobbles, and other brutal means of restraint. As a matter of humanity and economy, anæsthetics for local and general administration should be supplied to the veterinary surgeon.

PROTECTION AGAINST FIRE.

Organizations for the protection of Government property are generally maintained and, with few exceptions, fire drills have been regularly held.

Insufficiency of pressure or supply of water has been reported at a few posts.

POST LIBRARIES.

The condition of the post libraries is generally reported to be unsatisfactory. Attention is invited to the following extract from the report of Major Sanger:

As a rule the rooms are not suitable, and among the books are very few volumes of history, biography, or fiction. In fact, the libraries need a regular overhauling with a view to their renovation and perfection. It is recommended that post commanders be called on for catalogues of the library books, and that post exchange councils be instructed to make a regular appropriation for the purchase of books. Many of the standard military histories and biographies are suitable for our post libraries, which, with a good encyclopedia and a proper selection of books of travel and fiction, would make a useful and popular collection. It is only necessary to note the battered condition of most of the readable books to understand how much they are appreciated by the men.

And Major Moore says:

The source of supply was cut off when the funds accruing from profits of bakeries went to the companies, and there has been nothing so far to take its place. It is true that exchange funds can be used for the purpose, but the exchange councils, as at present constituted, are loath to appropriate money to be thus used. At only one post did I find that this had been done, and the books so purchased were not turned over to the post library, but taken up as an exchange library and as assets of

the exchange. A good many of the old books need rebinding, and exchange councils need urging to appropriate for their repair.

I recommend that all library books be dropped from the property returns of post quartermasters. I believe that this has been done in some cases, but at some posts they are still so carried. There is no good reason why the Quartermaster's Department should have anything to do with the books. The newspapers and magazines are partly contributed by the Quartermaster's Department, but books never. Complaint is made that funds of the soldier, arising at the exchange, are diverted for the repair of quartermaster property (library books). If the books were transferred to the post treasurer, this complaint would be groundless. To make up somewhat for the lack of new books in the post libraries, a large number of companies have associations by which they are supplied at their own expense with books and periodicals. However, they are generally of a light character, and but few standard works are to be found in the company library.

POST EXCHANGES.

They are reported in good condition and only a few posts remain without the advantages of an exchange.

The following suggestions are made by Major Moore:

Exchange regulations.

As regards the exchange regulations, I would recommend that instead of taking inventory every month by a changing council one be made each quarter and by a more permanent council. The time consumed in making the monthly statement and inventory, when not done perfunctorily, is unnecessary and burdensome on the exchange. The council should be composed of the senior officers of the post, and not company officers. The latter are too desirous of big dividends, have different ideas about its management, and, when changed monthly, bring conflict instead of harmony into its workings.

Dividends.

It might also be well to limit the dividend. I think $1 a month per man should be the maximum. I believe it would also be well to fix a basis by which profits are to be distributed. This is a cause of dissension at some posts, and department commanders may differ in their views on the subject. As the exchange is necessarily cooperative, it seems to me a fair way would be, first, to pay a certain per cent on the capital to each organization, then distribute the remainder according to the volume of business, exclusive of sale of beer, given by each organization.

Exchange membership.

It would also be fairer to organizations buying or selling exchange membership to base the value on their maximum strength, rather than per capita. It often happens that companies arrive at a post with reduced numbers. In a few days, by receiving recruits, they are up to the maximum, and advantage is thus gained over an organization arriving at the same time with maximum strength.

Post exchange profits (per cent).

Inspection districts.	Per district.			
	Beer.	Cigars.	Eatables.	All other articles.
South Atlantic	85.6	32.1	14.3	19
Middle	133	39	16	20
Pacific	82.5	26.6	9.4	13
Northern	114	31	10	17
Southern	62.8	33.3	14.1	16.1
Sum of percentages	477.9	162	63.8	85.1
Average	95.6	32.4	12.8	17
Maximum	133	39	16	20
Minimum	62.8	26.6	9.4	13

Post exchange profits (per cent)—Continued.

Inspection districts.	Maximum at posts.			
	Beer.		Cigars.	
	Per cent.	Posts.	Per cent.	Posts.
South Atlantic	125	Fort McHenry, Md.	66	Key West Barracks, Fla.
Middle	200	Fort Thomas, Ky.	66.6	Fort Logan H. Roots, Ark.
Pacific	100	(a)	40	Alcatraz Island and Fort Mason, Cal.
Northern	250	Fort Leavenworth, Kans.	55	Fort Washakie, Wyo.
Southern	100	Fort Reno, Okla., and Fort Wingate, N. Mex.	75	Fort McIntosh, Tex.
Sum of percentages	775		302.6	
Average	155		60.5	
Maximum	250	Fort Leavenworth, Kans.	75	Fort McIntosh, Tex.
Minimum	100	(b)	40	Alcatraz Island and Fort Mason, Cal.

Inspection districts.	Minimum at posts.			
	Beer.		Cigars.	
	Per cent.	Posts.	Per cent.	Posts.
South Atlantic	50	Key West Barracks, Fla.	10	Fort Monroe, Va.
Middle	63	Fort Logan H. Roots, Ark.	24	Fort Sheridan, Ill.
Pacific	25	Fort Duchesne, Utah	10	Fort Walla Walla, Wash.
Northern	40	Fort Logan, Colo.	10	Fort Logan, Colo.
Southern	25	Fort Grant, Ariz., and Fort Ringgold, Tex.	17	Fort Apache, Ariz.
Sum of percentages	203		71	
Average	40.6		14.2	
Maximum	63	Fort Logan H. Roots, Ark.	24	Fort Sheridan, Ill.
Minimum	25	Fort Duchesne, Utah; Fort Grant, Ariz.; Fort Ringgold, Tex.	10	(c)

a Alcatraz Island, Cal.; Boise Barracks, Idaho; Fort Mason, Cal.; Fort Missoula, Mont.; Fort Sherman, Idaho; Fort Spokane, Wash., and Fort Walla Walla, Wash.
b Seven posts in the Pacific district and two in the Southern district.
c Fort Monroe, Va.; Fort Walla Walla Wash., and Fort Logan, Colo.

POST BAKERIES.

The post bakeries are generally reported in good repair, and excellent police, and their product satisfactory.

POST CEMETERIES.

The regulations in regard to post cemeteries seem to have been generally carried out. They are reported in good condition and well cared for.

At posts located near a national cemetery it appears to be good policy to discontinue the cemetery at the post and to remove the dead to the national cemetery.

A FUND FOR THE WIDOWS AND ORPHANS OF MILITARY MEN.

The poverty and desolation of the widows and orphans of military men suggest that the Government, like the Pennsylvania Railroad Company and other model corporations, should provide some inexpensive system in the Army which would provide more decorously for this

recognized contingency. The heedlessness of men who habituaiy carry their lives in their hands at the orders of others is proverbial; and the duty is imposed and recognized as resting upon those who conduct a particularly dangerous business to furnish proper care for the sufferers. That the Government has been generous with pecuniary relief may make it all the more willing to exercise due though inexpensive care to perfect the relief bestowed.

Generally, what is fair for one person is fair for all. There is a stoppage against the soldier's pay to insure care for his old age, in addition to any pension, and if a similar per cent of the pay of all persons hereafter appointed in the Army could be retained until they finally leave the service, and all fines and forfeitures imposed upon commissioned officers by courts-martial and not otherwise expressly dedicated, could go to this fund, a commendable relief to the desolation and poverty of these widows and orphans could be insured, under such regulations as the Secretary of War might establish, without any increased expense to the Government. But an inexpensive and humane suggestion may deserve rather than find warm supporters. This suggestion has received favorable attention and support from distinguished officers.

POST GARDENS.

Post gardens are reported maintained at 52 posts, and the incomplete information received concerning them may be sufficiently indicated tersely in a table.

Inspection districts.	Total number.	Number of posts.	Number of acres under cultivation.	Number of posts.	Enlisted men employed	Number of posts.	Cost of cultivation. *a*	Number of posts.	Approximate value of product.	Number of posts.	Approximate amount of product, in pounds.
North Atlantic	15	9	42	.....	.....	.....	.....	.....	.....	.....	.....
Middle	7	7	80	4	26	6	$598.23	.....	.....	4	214,510
Pacific	8	.....	.....	.....	.....	2	325.08	.....	.....	.....	.....
Northern	11	11	253.5	10	68	11	1,123.62	10	$9,857.10	7	1,091,000
Southern	11	11	91.5	8	37	10	527.37	8	7,364.00	7	154,400
Total	52	.....	467	.....	131	.....	2,574.30	.....	17,221.10	.....	1,459,910
District average	10.4	.....	116.7	.....	43.7	.....	643.57	.....	8,610.55	.....	486,637
Post average	.....	.....	12.3	.....	6	.....	87.04	.....	956.73	.....	81,106

a Not including cost of labor.

INTERIOR ECONOMY OF COMPANIES.

The reports show that the companies are generally well commanded and administered, their barracks and grounds thoroughly policed, and the uniforms, arms, and equipments neatly kept.

Attention is invited to the following extract from the report of Major Sanger:

In some instances the companies were divided into three squads in place of four as required by paragraph 267, Army Regulations, so as to conform to the number of squad rooms; in many instances the canteens were marked as prescribed for the knapsack, and there was but little uniformity in packing the knapsack, either in respect to its contents or the arrangement of the articles. Of 23 batteries of artillery, but 3 were provided with shelter tents. In this connection I beg leave to recommend an order from Army Headquarters which will remedy these defects, and which will prescribe what shall be carried in the knapsack by all foot soldiers

and light artillerymen, and what shall be carried in the blanket roll. In some regiments, as for example the Fourth Artillery, the expressions "heavy" and "light marching order" have been defined, but they do not seem to have a significance corresponding to the usages of the Army. The knapsack is indispensable in time of peace for short marches, encampments, and when changing station as a receptacle for the articles necessary for the soldier's comfort, but the list of articles should be prescribed by the highest authority, and not left to the whim or inexperience of the soldier. But while the knapsack is, and probably always will be, a recognized part of the foot soldier's equipment, no one at all familiar with the characteristics of Americans will expect them to carry it when required to march and fight; the blanket roll is at once substituted, and every article except the clothes actually worn, the blanket, and a change of underclothing, is discarded.

The shelter tent designed by Capt. E. Rice, Fifth Infantry, and packed as he prescribes, meets the requirements of the service more completely than anything I have seen, and I recommend its trial.

In concluding this subject, I do not think sufficient attention is paid in some companies to paragraphs 255, 256, 267 and 271, Army Regulations. Inspection by noncommissioned officers of their squads is by no means common, and I have questioned privates who did not know the number of their squad, or who was in charge of it.

CENSUS OF POSTS.

The following table shows the census of the persons not on the morning report at the military posts:

Inspection districts.	Officers' families.				Enlisted men's families.				Civilian employees.				Unclassified.	Aggregate.
	Males.		Females.		Males.		Females.		Males.		Females.			
	Adults.	Children.	Adults.	Children.	Adults.	Children.	Adults.	Children.	Adults.	Children.	Adults.	Children.		
North Atlantic	37	114	381	115	33	374	353	392	181	25	148	22	5	2,180
South Atlantic	76	66	189	56	23	68	96	95	17	6	28	4	27	751
Middle														
Pacific	28	78	167	94	5	161	194	149	46	21	37	18	1	999
Northern	123	155	500	177	50	244	373	241	158	91	138	83	13	2,346
Southern	56	100	262	103	66	217	250	219	139	48	69	65	194	1,788
Total	320	513	1,499	545	177	1,064	1,266	1,096	541	191	420	192	240	8,064

IRREGULARITIES AND DEFECTS.

The number of irregularities reported under the operation of Army Regulations, paragraph 875, was 1,385. Of this number 645 were acted upon by post commanders and 740 remain unexplained or not acted upon. Those not yet reported as acted upon or remedied refer to matters relating to construction, arrangements, or repairs of buildings.

INSPECTION OF UNSERVICEABLE PROPERTY.

Seventeen hundred and thirty-one inventory and inspection reports, containing public property offered to inspectors with a view to its condemnation, were received to June 30, 1897. This is an increase of 99 over the previous year, and is 479 less than in 1895. Of the above number 1,438, or 83 per cent of the inspections, were made by officers of this department, and 293, 17 per cent, by officers especially designated. Last year the figures were 77 and 23 per cent, respectively. So the principle that inspectors should inspect seems fairly recognized in this rather trying but exacting duty.

The reports contain 3,382,088 articles, including units of weights and measures, which, from the most accurate approximation possible, appear to have originally cost in the neighborhood of $2,459,251.61. Of this, property which cost when new, approximately, $1,662,956.98, was condemned, and $796,294.63 was retained in service. Last year, $1,332,206.50 (approximately) was condemned, and $96,250.85 retained in service.

The increase this year over the figures of last year is accounted for in the major part by a large inspection of ordnance and ordnance stores made at Augusta Arsenal in May, 1896, the third copy of the report of which failed to reach this office until August, too late to be included in the figures for that year.

About the same number (90 per cent) as last year have the cost price given on a majority of the articles inventoried.

In quartermaster supplies some confusion is reported from the Northern inspection district in regard to the method in presenting these stores to the inspector. An extract from Maj. Francis Moore's summary of his annual tour of inspection is as follows:

> Different methods prevail at posts regarding the presentation of unserviceable quartermaster property for inspection. At some posts the property is held until the arrival of the inspector and then presented by the responsible officer, while at others the property is turned back to the quartermaster from time to time, who holds it and presents it for inspection. The first method is, in my opinion, the best and most economical, although involving more labor for the inspector. Not infrequently I found property that had been turned back to the Quartermaster's Department which in my judgment was still serviceable, and if in the hands of an organization would not have been condemned by me; but having gotten back into the Quartermaster's Department, it could not again be issued. Again, at most posts it is difficult for the Quartermaster's Department to find storage room for this class of property, while there is usually sufficient room about the barracks or stables for the purpose.

Coal has been extensively condemned during the past year. At three posts—Assiniboine, 80,000 pounds; Douglas, 234,684 pounds, and Russell, 114,770 pounds—over 190 long tons became slaked and unfit for use. Fifty thousand pounds were reported condemned at Assiniboine during the fiscal year 1896. The 114,770 pounds reported as slaked at Russell was part of a shipment of 688,000 pounds, and represents about 17 per cent, costing $172.16. This was ordered sold by the inspector and brought $7 at the sale.

The condemnation of subsistence stores for the year was $2,398.66, which is $218.89 less than was condemned last year and $1,414.02 less than the year before.

The amount of potatoes condemned this year, as shown by the reports received to June 30, 1897, was 37,451 pounds, against 67,411 pounds last year, a decrease of 29,960 pounds. The specially close attention paid to the matter by this Bureau seems to secure due economy.

One hundred and seventy-three inspections of engineer property were made during the year, and all but three were made by officers of this department. Last year there were 168 inspections. It is a difficult matter to make an estimate of the original value of this property, owing to a great number of the reports failing to contain the required data; but taking the articles that have the price given as a basis, the value of the articles eliminated is estimated to be $441,934.99.

A suggestion in regard to placing a certain percentage of such articles on an expendable list—as brooms, brushes, cans, kettles, pots, spoons, forks, knives, dishes, buckets, baskets, and articles of a like nature—has been under consideration.

PUBLIC ANIMALS.

The inventory and inspection reports received to June 30, 1897, show that 1,290 public animals, costing when purchased about $171,217.44, were offered for condemnation, and of this number 1,156, approximating $154,072.63, were condemned, and 134, whose purchase price was about $17,144.81, were retained in service.

For the corresponding period last year 1,514 animals were presented to inspectors, and 1,332 condemned and 182 retained in service.

A tabulation of the cavalry and artillery horses condemned during the year, exhibiting the number in each inspection district, is presented. Eight hundred and sixty-five animals—750 originally valued at $93,599.12, pertaining to the cavalry, and 115, whose cost price was $18,406.18, belonging to the artillery—were eliminated from the service.

The average age of the animals condemned, as far as can be ascertained, was 12.98 years for the cavalry and 11.92 years for the artillery. Four horses were condemned at 4 years of age, and two reached the age of 29, two 30, and one 31 years. A good deal of sentiment is displayed concerning these old horses both in and out of the ranks. The absolute efficiency of a military organization makes exacting demands, and how and when elderly animals should be relieved from further duty in the ranks may deserve more attention. It is believed the Army was never furnished with a better mount than it is getting now, and most of the horses are being bought at an age that, with proper handling, they should improve in the service and receive the best instruction readily and give the full advantage of the improved training they receive during a fair amount of service. I was informed by the captain commanding Troop A, Wisconsin Cavalry, that the troop, as an organization, owned its mounts and the horses cost about an average of $70. So it appears that the present time is peculiarly well chosen to perfect the mount of our cavalry.

The oldest horses condemned appear to be in the southern inspection district, and the youngest in the middle inspection district.

The average length of service of 681 horses (excluding those that served less than a year and those for which the data was not given) is 6.12 years for cavalry and a fraction less than 6 years for artillery. Last year the figures were 6.02 years for cavalry and 7.02 for artillery.

In this connection it may be well to invite attention to the small average length of service of some of these horses, even with such excessive retention, in comparison with those of foreign service. In England in 1895, for instance, statistics seem to indicate that the average time in service was about ten years. There does not appear to be any good reason why horses, if properly handled, should not last as long in our service as elsewhere, more especially during the present comparatively quiet time.

Fifty horses—44 in the cavalry and 6 in the artillery—were condemned before they had completed a year's service. Last year 28 in the cavalry and 9 in the artillery failed to complete their first year. One horse in the Northern inspection district is reported to have had twenty-one years' service. Perhaps there is nothing supplied which is more apt to receive criticism or condemnation before being fully broken into the service than the horses, but the approval of those furnished has never seemed more marked.

There were fifty-eight different causes of condemnation as approximately classified. Among these it appears that 162 horses were condemned for old age and 155 had chronic lameness. Last year's tabulation showed a condemnation of 156 horses for being vicious and

unmanageable, 84 of which were in one inspection district, where 38 out of 65 inspections of animals were made by special inspectors. This large condemnation resulted, on September 3, 1896, in the following instructions from the office of the Secretary of War:

> Let department commanders be informed that during the past year 970 cavalry horses have been condemned, and among them 36 for viciousness and 117 for being intractable. It is estimated that these 153 horses cost the United States about $20,000.

The reports this year show a great reduction in the condemnation for these causes.

The responsibility for the selection or reexamination of the horses might be thrown more upon each troop and battery commander, and if one exceeded a due allowance of horses while performing garrison service attention might be attracted to it in the same way as to other supplies. Perhaps there is nothing in the company economy which has received less attention heretofore from superior authority. The training of the horses in the companies, as reported, was as ill-advised in many respects, in former times, as the method of purchase; but it is time both should be perfected and the Government receive the benefit of the best the Army can do.

A small table is appended, showing the number of inspections made in each inspection district by regular and special inspectors, and attention is invited to the quite unnecessarily large number made by the latter. It has been observed that special inspectors are sometimes designated for this duty when a regular inspector was available, as illustrated by the five inspections made at a single post in May while several officers of the Inspector-General's Department, whose proper function it is to perform this special duty, were in the immediate neighborhood. It is recommended that these details be discontinued except in urgent cases. It is well for the shoemaker to stick to his last, and it is well to leave the recommendation of the destruction and sale of public property generally to the body of officers appointed by the President and designated by the law for that duty.

Cavalry and artillery horses, 1897—Number of inspections made and number of horses inspected in each district.

District.	Regular inspectors.				Special inspectors.				Total.			
	Inspections made.	Horses.			Inspections made.	Horses.			Inspections made.	Horses.		
		Presented.	Retained.	Condemned.		Presented.	Retained.	Condemned.		Presented.	Retained.	Condemned.
North Atlantic	6	67	8	59	10	48	.....	48	16	115	8	107
South Atlantic	5	30	1	29	8	26	.....	26	13	56	1	55
Middle	10	36	1	35	9	31	1	30	19	67	2	65
Northern	24	93	8	85	48	283	28	255	72	376	36	340
Southern	21	164	31	133	16	76	14	62	37	240	45	195
Pacific	3	30	2	28	18	85	10	75	21	115	12	103
Total	69	420	51	369	109	549	53	496	178	969	104	865

ACCOUNT OF SALES AT AUCTION.

During the past fiscal year 758 inspection reports, directing the sale of condemned stores, were received under paragraph 889. Of this number but 188 were reported under paragraph 679, showing a culpable degree of negligence in carrying out the Army Regulations, which should be corrected.

All inventories of public animals and the auctioneer's account of sales should invariably give the names by which they are known in service. Neglect in this respect has resulted in the substitution and sale of an animal which had not been inspected for one which had been condemned. However much this may be thought to be in the interests of the service, only one method of selling worn-out property is allowed by law.

A uniform blank for the use of the different branches of the service in reporting these sales has been submitted and recommended as a substitute for the diverse forms now authorized. The object of the prepared form is to establish uniformity and simplicity in such reports, with a view to their easy tabulation and comparison. In this connection your attention is invited to Circular No. 6, Treasury Department, Comptroller's Office, January 9, 1897, which prescribes a form and regulations for rendering accounts of sales of old materials, and directs that this form be accompanied by a complete inventory of the property sold.

The total amount received from the sales reported is shown in the following table:

Report of sales at auction, 1897.

[Army Regulations, paragraph 679.]

Designation.	Number of reports received.	Number of animals sold.	Net amount received from sales.
Quartermaster's Department:			
Cavalry and artillery horses	.....	444	$6,039.60
Mules and draft horses	124	189	2,866.76
Quartermaster supplies	.....	.....	8,550.90
Commissary Department	12	.....	73.00
Medical Department	15	.....	995.99
Ordnance Department	1	.....	7.40
Engineer Department	32	.....	3,518.34
Signal Corps	3	.....	68.52
Miscellaneous	1	.....	20.00
Total	188	633	22,140.51

Average received from sale of cavalry and artillery horses $13.60
Average received from sale of mules and draft horses 15.17

IMPROVED STATUS.

In conclusion, it may be permitted to express gratification that in many directions, but especially in the matter of promotions, a feeling of relief has been extended which has injured no one, but has encouraged many; for however slight it seems to others it actually gave a ray of hope, and is a decided advance over the dark days through which the service has been passing. Anyone who can remember how the Army lived and was supplied a generation ago must appreciate the beneficial change already consummated or still in progress. In every line of activity there is increasing reason for hope and encouragement. What has been done seems but a forerunner of what is to come; and every demand of the future can evidently be met as successfully as have been those of the past. Evidently the approaching century will be ushered in by one of the most progressive periods known in our military history; and the first elements of this change are already upon us.

Respectfully submitted.

J. C. BRECKINRIDGE,
Inspector-General.

The MAJOR-GENERAL COMMANDING THE ARMY.

APPENDIX A.

PROBLEMS IN MINOR TACTICS SUBMITTED AND SOLVED AT THE INSPECTIONS.

NORTH ATLANTIC DISTRICT.

Madison Barracks, N. Y.—To act as an advance guard for a supposed force in its rear, with orders that if attacked by a superior force a defensive position would be selected and held until the arrival of reenforcements from the main body.

Fort Niagara, N. Y.—Cover a designated front with outposts using Cossack posts instead of sentinels and pickets.

Plattsburg Barracks, N. Y.—Cover a designated front with a line of outposts, Cossack posts to be used in place of sentinels and pickets.

Fort Ethan Allen, Vt.—The squadron was taken about a mile up the Essex road and directed to form as an advance guard for a cavalry force marching to Burlington. * * * The information furnished the commander of the advance guard was that he would be opposed by hostile cavalry that would be outlined, and his instructions were to drive them off so that the march of the main column would not be delayed. The hostile cavalry were outlined by a few troopers posted near the edge of the open woods on the reservation some hundred yards off the road.

SOUTH ATLANTIC DISTRICT.

Fort McPherson, Ga.—The attack of a position (outlined) to take place this p. m. at 2 o'clock, on ground selected southeast of the post; and secondly, the attack and defense of an outpost (actual) to be established on ground east and south of the post, to be executed to-morrow morning. Assembly at 9.45 o'clock.

In the execution of this problem the following situation is assumed: A brigade of infantry (imaginary) with a small force of cavalry and artillery attached, moving via Tampa and West Atlanta and on Hapsville, goes into camp on North Utoy Creek, west of the Atlanta and West Point Railroad. The head of the advance guard of the brigade, consisting of eight companies of the Fifth Infantry, has reached the road from Lakewood to Knox at the point X on the map. On receiving orders the *advance guard will picket the ground between the east and west Jonesboro roads.* As the country is open the system of outposts prescribed in paragraph 648, Infantry Drill Regulations, will be observed. As soon as the outposts are established they will be inspected by the inspector. When the inspection is completed, of which due notice will be given, it will be assumed that the line is attacked. This will be made known by the firing of the sentinels, when the usual dispositions will be made, and the lines will be again inspected.

The commander of each company will designate two men of his company as wounded; the first aid will be given by the company stretcher bearers, who will then carry the wounded to such points as may be designated by the surgeon, where they will be held to await the arrival of the inspector. At the conclusion of the exercises, a report will be rendered to the post commander by the battalion commanders, of the operations of the respective battalions and companies, and by the post commander to the inspector, to whom all the reports will be forwarded accompanied by a topographical drawing or sketch of the ground occupied and described in this letter.

Fort Myer, Va.—A force of the enemy, consisting of one brigade of infantry, with cavalry and artillery attached, is moving from Great Falls down the right bank of the Potomac.

Our force holds the left bank from the Chain to the Long Bridge. A brigade of our cavalry (imaginary) crosses Aqueduct Bridge at daylight with orders to reconnoiter in the direction of Great Falls for the purpose of ascertaining the strength and dispositions of the enemy. The squadron of the Sixth Cavalry at Fort Myer is the advance guard (actual) of the brigade.

NORTHERN DISTRICT.

Fort Riley, Kans.—A large force of the enemy is moving up the Kansas River; their scouts are reported west of Manhattan. Fort Riley has been reenforced, and it is determined to attack the enemy.

The cavalry troops will be formed into a cavalry screen; the batteries and assumed reenforcements will advance under cover of the screen.

The strength and composition of the garrison at Riley will be assumed in proper proportion to the cavalry screen and the assumed strength of the enemy.

Fort Crook, Nebr.—Fort Crook will be defended by one battalion of infantry against the attack of another battalion. All conditions for attack and defense will be assumed by the commanding officer.

Fort D. A. Russell, Wyo.—A hostile force is moving west from Nebraska along the line of the Union Pacific Railroad. The advance party has reached Cheyenne and is about to reconnoiter Fort Russell, which post has been reenforced. With the troops of the present garrison and its available resources, drive back this party and establish an outpost, so as to cover the east side of the fort. The rest of the territory, for its protection, will be covered by assumed troops.

Fort Niobrara, Nebr.—Fort Niobrara will be defended by one battalion of infantry against the attack of another battalion. All conditions for attack and defense will be assumed by the commanding officer.

Fort Assinniboine, Mont.—The United States are at war with Great Britain. The garrison of Fort Assinniboine has been strengthened. A force of the enemy is approaching from the Canadian frontier. The garrison has been ordered to destroy all stores and withdraw.

The present garrison, with ten companies of infantry added, will become the rear guard. Our forces will withdraw down the Montana Central Railroad for the defense of Great Falls. The rear guard is so closely pursued that it is forced to take up a position for defense.

The commanding officer will assume the line of the enemy's advance, the strength of the garrison and of the enemy, so that the rear guard will correspond.

Fort Washakie, Wyo.—A hostile force is moving north against Fort Washakie from the line of the Sweetwater; Washakie has been reenforced, but it has been determined to destroy the stores and abandon the post.

The present garrison will form the advance guard, moving down the Little Wind River. A hostile cavalry detachment is presumed to be trying to intercept the retreat.

The strength and composition of the assumed garrison and the enemy will be assumed by the commanding officer.

Fort Meade, S. Dak.—The commanding officer will detail one squadron to form an outpost for the defense of Fort Meade; the other squadron will attack it. All conditions for this exercise will be assumed by the commanding officer.

Fort Robinson, Nebr.—The country to the west has arisen in rebellion. The garrison at Robinson has been largely reenforced. The enemy is presumed to be marching east along the Fremont, Elkhorn and Missouri Valley Railroad.

The present garrison at Robinson will be formed into a cavalry screen to cover the advance of the main body against the enemy.

The position and strength of the enemy will be assumed. The strength and composition of the new garrison at Robinson will be assumed in proper proportion to the cavalry screen and the assumed strength of the enemy.

Fort Custer, Mont.—The country is in great disorder. Wyoming and Nebraska are in rebellion. The United States are concentrating troops and stores at Custer Station, on Northern Pacific Railroad. Fort Custer contains valuable stores which are to be withdrawn to the base at Custer Station. The Burlington Railroad has been destroyed from Fort Custer to the Crow Agency, at which latter point rebel troops have just arrived destined for the capture of the fort.

The present garrison will hold the enemy's force in check until reenforcements arrive from Custer Station.

The commanding officer will assume the strength and composition of the enemy and the reenforcements so as to bear a proper proportion to the garrison.

Fort Keogh, Mont.—An insurrection has sprung up in the West. The Pacific Coast States and western Montana are held by the rebels. An insurgent army is moving east down the Yellowstone and are now at Rosebud. The Northern Pacific Railroad has been destroyed west of Fort Keogh. The United States have determined to reenforce Keogh and make a stand there. Five companies of infantry have already arrived. The rebels, knowing this, have detached a regiment of cavalry to make a dash and capture the post. With the five companies of infantry and assumed reenforcements take position for defense of the post against the cavalry raid.

The troop at the post will be used to represent the enemy.

The commanding officer will assume the time of receipt of information of the movement and the time it will reach Keogh.

Fort Leavenworth, Kans.—Fort Leavenworth will be attacked by a battalion of infantry and two troops of cavalry; it will be defended by a like number of troops.

The commanding officer will assume all conditions for attack and defense.

Fort Logan, Colo.—The command will be equally divided; one-half will defend Fort Logan against attack from the other half. The commanding officer will assume all conditions for the defense and attack.

Fort Yates, N. Dak.—A hostile force is moving up the Missouri River. Fort Yates has been reenforced.

The commanding officer will establish his present garrison on outpost duty so as to cover the quadrant extending from south to west. The remainder of the territory will be covered by assumed troops.

The commanding officer will assume the size and character of his reenforcements so as to be in proper proportion to the covering troops.

SOUTHERN DISTRICT.

Fort Sill, Okla.—Rear guard attack and defense.

Fort Huachuca, Ariz.—The attack and defense of a convoy.

Fort Wingate, N. Mex.—The destruction of a depot of supplies, and the cutting of the railroad at Wingate Station.

Fort Clark, Tex.—The defense of an intrenched camp. Two troops cavalry and four companies of infantry against like imaginary force advancing from the Rio Grande by way of Dolores.

PACIFIC DISTRICT.

Presidio of San Francisco, Cal.—The defense of the batteries at Fort Point from an attack in rear.

MIDDLE DISTRICT.

Fort Brady, Mich.—The establishment of outposts and attack and defense of the same.

Jefferson Barracks, Mo.—The attack and defense of outposts.

APPENDIX B.

CAVALRY AND ARTILLERY HORSES AND CAVALRY ORDNANCE CONDEMNED, FISCAL YEAR 1897.

Tables showing number of animals, value when purchased, age at condemnation, length of service, and cause of condemnation. Inspected by regular and special inspectors.

REPORTED AGE AT CONDEMNATION.

Designation.	Number of animals.	Value when purchased.	Years. 4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Not given.	Average.
North Atlantic district:																																
Cavalry	79	$10,367.76			4	2	2	3	8	8	5	8	9	5	12	5	2				2	1								3	13.08
Artillery	28	4,765.40		1	3	5	2	4	1	1	2	2		1	1		2		3												11
Total	107	15,133.16		1	7	7	4	7	9	9	7	10	9	6	13	5	4		3		2	1								3	
Average Cavalry		131.23																														
Average Artillery		170.19																														
South Atlantic district:																																
Cavalry	36	4,050.45	1		2	6	2	5	6	2	3	4	2		1	1														1	10
Artillery	19	3,028.55			1	1	3	1	1	3	1	1	3	1	2					1											12.32
Total	55	7,079.00	1		3	7	5	6	7	5	4	5	5	1	3	1				1										1	
Average Cavalry		112.51																														
Average Artillery		159.40																														
Middle district:																																
Cavalry	61	7,733.49	1	9	11	4	2	5	5	5	2	5	3	3	2	1	2	1														9.66
Artillery	4	570.25				1		2	1																							8.75
Total	65	8,303.74	1	9	11	5	2	7	6	5	2	5	3	3	2	1	2	1														
Average Cavalry		126.78																														
Average Artillery		142.56																														
Northern district:																																
Cavalry	302	35,852.56	1	2	15	22	22	23	19	13	25	13	21	22	23	14	20	7	21	5	3	1		1	2			1	1		5	13.18
Artillery	38	5,921.60			2	2	2	4	4	4	1	4	1	2	1	1	2	1	1	4	1	1										13.34
Total	340	41,774.16	1	2	17	24	24	27	23	17	6	17	22	24	24	15	22	8	22	9	4	2		1	2			1	1		5	
Average Cavalry		118.72																														
Average Artillery		155.83																														

Southern district:																															
Cavalry	186	24,371.14	1	6	9	12	12	13	7	8	8	9	11	11	15	18	11	3	6	6	4	3	...	1	3	1	1	1	1	1	4	13.89
Artillery	9	1,341.93	...	...	...	...	1	...	1	...	...	1	1	2	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14.22
Total	195	25,713.07	1	6	9	12	13	13	8	8	8	10	12	13	15	19	13	3	6	6	4	3	...	1	3	1	1	1	1	1	4	.....
Average { Cavalry	.....	131.03	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.....	.....
Average { Artillery	.....	149.10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.....	.....
Pacific district:																																
Cavalry	86	11,223.72	...	1	5	3	2	8	6	6	5	3	7	6	7	7	7	4	4	1	...	1	..	1	2	...	...	...	...	...	.....	13.85
Artillery	17	2,778.45	...	1	1	2	5	...	2	...	2	...	2	1	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.....	9.35
Total	103	14,002.17	...	2	6	5	7	8	8	6	7	3	9	7	7	8	7	4	4	1	...	1	...	1	2	...	...	...	...	...	.....	.....
Average { Cavalry	.....	130.51	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.....	.....
Average { Artillery	.....	163.44	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	.....	.....
Recapitulation:																																
Cavalry	750	93,599.12	4	18	46	49	42	57	51	42	48	42	53	47	60	46	42	15	31	12	9	6	...	3	7	1	1	2	2	1	13	12.98
Artillery	115	18,406.18	...	2	7	11	13	11	10	8	6	8	7	7	4	3	6	1	4	5	1	1	...	...	...	...	...	...	...	...	.....	11.92
Grand total	865	112,005.30	4	20	53	60	55	68	61	50	54	50	60	54	64	49	48	16	35	17	10	7	...	3	7	1	1	2	2	1	13	.....

	Cavalry.	Artillery.
General average cost horse condemned	**$124.80**	**$160.06**
Average amount received from sales	**13.55**	**14.09**
Net loss (without considering service rendered)	**111.25**	**145.97**

Tables showing number of animals, value when purchased, age at condemnation, length of service, and cause of condemnation, etc.—Continued.

REPORTED LENGTH OF SERVICE.

Designation.	Number of animals.	Value when purchased.	Years.																					Average.
			Less than a year.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	Not given.	
North Atlantic district:																								
Cavalry	79	$10,367.76	1	3	3	5	13	8	2	6	13	5	8	2	3	1	....	1	.....	.....	1	.....	.....	4	8
Artillery	28	4,765.40	2	3	4	4	4	2	2	1	....	3	2	1	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4.46
Total	107	15,133.16	3	6	7	9	17	10	4	7	13	8	10	3	3	1	....	1	.....	.....	1	.....	.....	4	.....
Average Cavalry	.....	131.23	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Average Artillery	.....	170.19	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Atlantic district:																								
Cavalry	36	4,050.45	4	2	3	.....	.....	2	1	1	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	4.45
Artillery	19	3,028.55	1	1	5	.....	.....	2	1	2	2	3	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	5.94
Total	55	7,079.00	5	3	8	.....	.....	4	2	3	3	3	2	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	21	.....
Average Cavalry	.....	112.51	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Average Artillery	.....	159.40	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Middle district:																								
Cavalry	61	7,733.49	13	5	6	4	6	9	1	5	6	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	4.89
Artillery	4	570.25	.....	1	....	2	....	1	....	....	....	....	....	....	....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
Total	65	8,303.74	13	6	6	6	6	10	1	5	6	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	.....
Average Cavalry	.....	126.78	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Average Artillery	.....	142.56	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Northern district:																								
Cavalry	302	35,852.56	17	7	28	28	20	25	14	15	15	13	18	12	6	9	1	6	....	.....	.....	1	1	66	6.50
Artillery	38	5,921.60	.....	2	2	....	4	6	5	4	2	1	2	....	1	3	2	3	1	.....	.....	.....	.....	.....	7.77
Total	340	41,744.16	17	9	30	28	24	31	19	19	17	14	20	12	7	12	3	9	1	....	....	1	1	66	.....
Average Cavalry	.....	118.72	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Average Artillery	.....	155.83	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Southern district:																								
Cavalry	186	24,371.14	8	8	18	18	4	16	2	16	19	16	8	13	7	5	1	1	1	2	.....	.....	.....	23	6.88
Artillery	9	1,341.93	.....	.....	.....	.....	2	.....	.....	.....	2	1	....	2	1	1	.....	.....	.....	.....	.....	.....	.....	.....	8.88
Total	195	25,713.07	8	8	18	18	6	16	2	16	21	17	8	15	8	6	1	1	1	2	.....	.....	.....	23	.....
Average Cavalry	.....	131.03	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Average Artillery	.....	149.10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

Pacific district:																									
Cavalry	86	11,223.72	1	2	9	7	4	4	4	13	2	7	4	5	2	3	....	1	1	....	....	....	....	17	6.76
Artillery	17	2,778.45	3	2	1	3	2	1	....	2	....	1	2	....	....	....	....	....	....	....	....	....	....	.....	4.93
Total	103	14,002.17	4	4	10	10	6	5	4	15	2	8	6	5	2	3	....	1	1	....	....	....	....	17	.....
Average (Cavalry	.....	130.51	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Average (Artillery	.....	163.44	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Recapitulation:																									
Cavalry	750	93,599.12	44	27	67	62	47	64	24	56	56	41	39	35	18	18	2	9	2	2	1	1	1	134	6.12
Artillery	115	18,406.18	6	9	12	9	12	12	8	9	6	9	7	3	2	5	2	3	1	....	....	....	....	.....	6
Grand total	865	112,005.30	50	36	79	71	59	76	32	65	62	50	46	38	20	23	4	12	3	2	1	1	1	134	.....

Tables showing number of animals, value when purchased, age at condemnation, length of service, and cause of condemnation, etc.—Continued.

CAUSE OF CONDEMNATION.

Designation.	Number of animals.	Value when purchased.	Back broken.	Balky.	Blind.	Blind staggers.	Broken down.	Broken leg.	Chest disease.	Colic, chronic.	Clumsy.	Contracted feet.	Cut, barbed wire.	Exostosis.	Eczema.	Fistula.	Fits.	Foundered.	Fractured jaw.	Glanders.	Head injured.	Heaves.	Hemorrhage.	High withers.	Injured by accident.	Lameness, chronic.	Laminitis, chronic.	No gait.	Old age.	Paralyzed.	Purpura hemorrhagica.
North Atlantic district:																															
Cavalry	79	$10,367.76	....	....	1	....	8	1	....	....	....	....	....	....	....	....	....	2	4	1	....	1	....	....	....	12	....	2	12	....	....
Artillery	28	4,765.40	....	....	....	....	1	....	....	1	....	....	....	....	....	....	....	1	2	....	....	1	....	....	....	5	....	....	4	....	....
Total	107	15,133.16	....	....	1	....	9	1	....	1	....	....	....	....	....	....	....	3	6	1	....	2	....	....	....	17	....	2	16	....	....
Average {Cavalry	.....	131.23	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Average {Artillery	.....	170.19	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
South Atlantic district:																															
Cavalry	36	4,050.45	....	....	1	1	5	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	7	....	1	1	....	....
Artillery	19	3,028.55	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	....	2	....	....
Total	55	7,079.00	....	....	1	1	6	1	....	....	....	....	....	....	....	....	....	....	....	....	1	2	....	....	....	8	....	1	3	....	....
Average {Cavalry	.....	112.51	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Average {Artillery	.....	159.40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Middle district:																															
Cavalry	61	7,733.49	....	....	5	....	4	....	....	....	1	....	....	....	....	....	....	3	....	....	....	....	1	1	....	16	....	2	2	....	1
Artillery	4	570.25	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....
Total	65	8,303.74	....	....	5	1	4	....	....	....	1	....	....	....	....	....	....	4	....	....	....	....	1	1	....	16	....	2	2	....	1
Average {Cavalry	.....	126.78	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Average {Artillery	.....	142.56	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Northern district:																															
Cavalry	302	35,852.56	1	1	6	2	14	1	1	1	3	5	1	1	....	1	2	1	3	....	....	2	....	....	....	61	6	4	60	2	....
Artillery	38	5,921.60	....	....	....	....	....	....	....	....	....	1	....	....	1	....	....	....	1	....	....	....	....	....	....	6	1	4	11	1	....
Total	340	41,774.16	1	1	6	2	14	1	1	1	3	6	1	1	1	1	2	1	4	....	....	2	....	....	....	67	7	8	71	3	....
Average {Cavalry	.....	118.72	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Average {Artillery	.....	155.83	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

Southern district:																																					
Cavalry	186	24,371.14			9		8	2				3		2		2		14	1			2	2		1	29	5	1	43	1	
Artillery	9	1,341.93				1		1																					5							
Total	195	25,713.07			9	1	8	3				3		2		2		14	1			2	2		1	29	5	1	48	1	
Average {Cavalry		131.03																																		
Average {Artillery		149.10																																		
Pacific district:																																				
Cavalry	86	11,223.72					1									1		5								11	1		21		
Artillery	17	2,778.45					2											1								7			1		
Total	103	14,002.17					3									1		6								18	1		22		
Average {Cavalry		130.51																																		
Average {Artillery		163.44																																		
Recapitulation:																																				
Cavalry	750	93,599.12	1	1	22	3	40	5	1	1	4	8	1	3		4	2	25	8	1		6	3	1	1	136	12	10	139	3	1
Artillery	115	18,406.18				2	4	1		1		1			1			3	3		1	2				19	1	4	23	1	
Grand total	865	112,005.30	1	1	22	5	44	6	1	2	4	9	1	3	1	4	2	28	11	1	1	8	3	1	1	155	13	14	162	4	1

Tables showing number of animals, value when purchased, age at condemnation, length of service, and cause of condemnation, etc.—Continued.

CAUSE OF CONDEMNATION—Continued.

Designation.	Number of animals.	Value when purchased.	Pneumonia.	Rheumatism.	Ringbone.	Runaways and unmanageable.	Rupture.	Shot.	Sore back, chronic.	Sore mouth, chronic.	Spavin.	Spine injured.	Stove up.	Stringhalt.	Stumbles.	Tender feet.	Tetanus, chronic.	Too heavy.	Tumor.	Ulcerated jaw.	Unfit for cavalry.	Unfit for artillery.	Unsound lungs.	Vicious.	Weakly.	Weak back, chronic.	Weak lungs.	Weak kidneys.	Weak knees.	Wind-broken.	Worn out.
North Atlantic district:																															
Cavalry	79	$10,367.76	....	....	....	2	....	1	2	....	....	....	5	2	....	....	....	....	....	....	....	....	1	1	....	....	....	1	3	6	11
Artillery	28	4,765.40	....	....	....	1	....	....	....	....	1	....	2	1	....	2	....	....	....	....	....	1	....	....	....	1	....	....	....	3	1
Total	107	15,133.16	....	....	....	3	....	1	2	....	1	....	7	3	....	2	....	....	....	....	....	1	1	1	....	1	....	1	3	9	12
Average (Cavalry	.....	131.23	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Average (Artillery	.....	170.19	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
South Atlantic district:																															
Cavalry	36	4,050.45	1	....	....	2	....	....	2	....	....	....	5	1	....	....	....	....	....	....	....	....	....	1	1	....	....	....	....	5	....
Artillery	19	3,028.55	....	....	....	....	....	....	....	....	....	....	10	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	2
Total	55	7,079.00	1	....	....	2	....	....	2	....	....	....	15	1	....	....	....	....	....	....	....	....	....	1	2	....	....	....	....	5	2
Average (Cavalry	.....	112.51	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Average (Artillery	.....	159.40	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Middle district:																															
Cavalry	61	7,733.49	....	....	2	3	....	....	8	....	1	....	1	2	....	2	....	....	....	....	....	....	....	....	1	....	....	1	....	....	4
Artillery	4	570.25	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....
Total	65	8,303.74	....	....	2	3	....	....	8	....	1	....	2	2	....	2	....	....	....	....	....	....	....	....	1	1	....	1	....	....	4
Average (Cavalry	.....	126.78	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Average (Artillery	.....	142.56	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Northern district:																															
Cavalry	302	35,852.56	1	8	1	24	2	....	12	1	3	1	7	2	5	....	....	....	2	....	....	....	....	14	6	13	....	4	2	5	10
Artillery	38	5,921.60	....	....	....	....	....	....	....	....	....	....	3	....	....	....	....	1	....	....	....	....	....	....	3	1	....	1	....	3	....
Total	340	41,774.16	1	8	1	24	2	....	12	1	3	1	10	2	5	....	....	1	2	....	....	....	....	14	9	14	....	5	2	8	10
Average (Cavalry	.....	118.72	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Average (Artillery	.....	155.83	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....

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Comparative statement showing the relation between the enlisted men and condemned horses in the cavalry for the fiscal years 1894, 1895, 1896, and 1897.

Regiment.	1894.			1895.			1896.			1897.			Total.			Quadrennial ratio.
	Enlisted strength June 30.	Number of horses condemned.	Ratio.	Enlisted strength June 30.	Number of horses condemned.	Ratio.	Enlisted strength June 30.	Number of horses condemned.	Ratio.	Enlisted strength June 30.	Number of horses condemned.	Ratio.	Enlisted strength.	Number of horses condemned.	Ratio per man per year.	
First	614	55	0.089	582	36	0.062	619	131	0.212	615	62	0.101	2,430	284	0.117	0.468
Second	618	60	.097	604	76	.126	635	98	.154	642	51	.079	2,499	285	.11	.456
Third	613	59	.096	591	77	.130	597	102	.171	588	139	.236	2,389	377	.158	.632
Fourth	555	65	.117	582	63	.108	587	62	.106	583	63	.108	2,307	253	.109	.436
Fifth	555	50	.09	584	31	.053	577	89	.154	593	46	.077	2,309	216	.094	.376
Sixth	608	32	.053	590	94	.159	630	125	.198	617	91	.147	2,445	342	.14	.559
Seventh	619	56	.09	595	73	.123	675	48	.071	591	95	.161	2,480	272	.11	.456
Eighth	613	52	.085	608	42	.069	573	90	.157	605	32	.053	2,399	216	.089	.356
Ninth	611	36	.059	567	51	.09	582	128	.22	584	62	.106	2,344	277	.118	.472
Tenth	583	56	.096	565	49	.087	570	47	.083	592	109	.184	2,310	261	.113	.452
Total	5,980	521	.087	5,868	592	.101	6,045	a 920	.15	6,010	750	.125	23,912	2,783	.116	.465
Maximum	Fourth	65	.117	Sixth	94	.159	First / Ninth	131 / 128	.212 / .22	Third	139	.236	Third	377	.158	.632
Minimum	Sixth	32	.053	Fifth	31	.053	Seventh	48	.071	Eighth	32	.053	Eighth	216	.089	.356

a General Orders 15, 1895, created some confusion in quartermaster supplies for a time, making it difficult to classify the horses by regiments; however, 920 out of 970 are classified.

CAVALRY.

Statement showing given value of ordnance and ordnance stores condemned in the fiscal years 1894, 1895, 1896, and 1897, and amount per man for each regiment and year.

Regiment.	1894.			1895.			1896.			1897.			Total.			
	Actual strength June 30.	Amount condemned.	Amount per man.	Actual strength June 30.	Amount condemned.	Amount per man.	Actual strength June 30.	Amount condemned.	Amount per man.	Actual strength June 30.	Amount condemned.	Amount per man.	Sum stated.	Amount condemned.	Amount per man.	Amount per four years.
First	658	$3,092.55	$4.70	626	$1,774.34	$2.83	664	$4,390.78	$6.61	658	$4,442.78	$6.75	2,606	$13,700.45	$5.25	$21.05
Second	661	4,443.46	6.72	647	3,663.75	5.66	680	3,875.42	5.69	684	2,716.56	3.97	2,672	14,699.19	5.50	22.00
Third	656	4,971.44	7.58	635	3,108.66	4.89	642	5,391.92	8.39	630	5,099.96	8.09	2,563	18,571.98	7.24	28.96
Fourth	598	3,430.94	5.74	626	5,124.33	8.19	632	3,294.31	5.21	626	4,990.82	7.97	2,482	16,840.40	6.78	27.16
Fifth	598	3,603.61	6.03	628	1,359.39	2.16	623	3,070.02	4.92	635	4,123.84	6.49	2,484	12,156.86	4.89	19.56
Sixth	651	3,063.74	4.71	633	4,945.15	7.81	675	3,645.59	5.40	660	2,814.88	4.26	2,619	14,469.36	5.52	22.08
Seventh	662	5,547.93	8.38	638	3,041.00	4.76	721	2,246.42	3.11	634	6,128.09	9.66	2,655	16,963.44	6.38	25.55
Eighth	657	4,855.64	7.39	651	4,401.52	6.76	618	3,882.84	6.28	647	3,028.07	4.68	2,573	16,168.07	6.28	25.12
Ninth	655	1,634.38	2.49	612	2,710.63	4.43	628	4,099.34	6.52	630	2,407.18	3.82	2,525	10,851.53	4.29	17.19
Tenth	627	6,250.22	9.96	610	5,417.24	8.88	616	2,362.78	3.83	636	1,997.26	3.14	2,489	16,027.50	6.43	25.78
Total	6,423	40,803.91	6.37	6,306	35,546.01	5.63	6,499	36,259.42	5.58	6,440	37,749.44	5.86	25,668	150,448.78	5.86	23.44
Maximum	Tenth	.....	9.96	Tenth	.....	8.88	Third	.....	8.39	Seventh	.....	9.66	Third	.....	7.24	28.96
Minimum	Ninth	.....	2.49	Fifth	.....	2.16	Seventh	.....	3.11	Tenth	.....	3.14	Ninth	.....	4.29	17.19

AVERAGE COST PER POST OF FUEL AND FORAGE, WITH MAXIMUM AND MINIMUM RATES.

Inspection districts.	Wood (per cord).		Coal (per ton).		Hay (per ton).	Straw (per ton).	Oats (per cwt.).	Corn (per cwt.).	Bran (per cwt.).
	Hard.	Soft.	Hard.	Soft.					
South Atlantic	$4.44	$3.52	$4.99	$3.52	$17.80	$14.60	$1.01	.....	$0.73
Middle	4.40	3.20	5.75	2.78	12.46	6.56	.81	$0.71	.61
Pacific	.....	3.56	.....	7.18	10.99	6.54	.94	.....	.68
Northern	.....	4.78	.....	3.82	8.80	5.94	.87	.65	.75
Southern	3.00	3.78	.....	18.74	11.71	8.99	1.21	1.04	.98
General average	3.95	3.78	5.37	7.21	12.35	8.53	.97	.80	.75

MAXIMUM RATES.

Inspection districts.	Wood.			
	Hard.		Soft.	
	Cost.	Post.	Cost.	Post.
South Atlantic	$8.00	Key West Barracks, Fla.	$4.65	Jackson Barracks, La.
Middle	6.50	Fort Thomas, Ky.	.....	.....
Pacific	.....	.....	6.49	Presidio of San Francisco, Cal.
Northern	.....	.....	6.69	Fort D. A. Russell, Wyo.
Southern	4.51	Fort Sill, Okla.	6.00	San Carlos, Ariz.
General maximum	8.00	Key West Barracks, Fla.	6.69	Fort D. A. Russell, Wyo.

Inspection districts.	Coal.			
	Hard.		Soft.	
	Cost.	Post.	Cost.	Post.
South Atlantic	$6.27	Key West Barracks, Fla.	$5.60	Fort Monroe, Va.
Middle	8.24	Fort Snelling, Minn.	4.70	Fort Snelling, Minn.
Pacific	30.00	Fort Sherman, Idaho.	9.00	San Diego, Cal.
Northern	.....	.....	5.45	Fort Yellowstone, Wyo.
Southern	.....	.....	a 45.00	Whipple Barracks, Ariz.
General maximum	30.00	Fort Sherman, Idaho.	a 45.00	Do.

Inspection districts.	Hay.		Straw.	
	Cost.	Post.	Cost.	Post.
South Atlantic	$22.18	Key West Barracks, Fla.	$22.18	Key West Barracks, Fla.
Middle	18.88	Fort Sheridan, Ill.	9.00	Columbus Barracks, Ohio.
Pacific	13.80	San Diego, Cal.	10.80	San Diego, Cal.
Northern	15.00	Fort Harrison, Mont.	8.41	Fort Harrison, Mont.
Southern	26.60	Fort Apache, Ariz.	12.60	Fort Wingate, N. Mex.
General maximum	26.60	.....do	22.18	Key West Barracks, Fla.

Inspection districts.	Oats.		Corn		Bran.	
	Cost.	Post.	Cost.	Post.	Cost.	Post.
South Atlantic	$1.25	Fort Barrancas, Fla.	.....	.....	$0.92½	Fort Barrancas Fla.
Middle	.94/10	Fort Logan H. Roots, Ark.	$0.87	Fort Snelling, Minn.	.70	Columbus Barracks, Ohio.
Pacific	1.18	Fort Canby, Wash.	.....	.....	.89	San Diego, Cal.
Northern	1.28	Fort Yates, N. Dak.	1.23	Fort Yates, N. Dak.	1.46	Fort Washakie, Wyo.
Southern	2.12	Fort Apache, Ariz.	2.64	Fort Apache, Ariz.	1.95	Fort Apache, Ariz.
General maximum	2.12	.....do	2.64	.....do	1.95	Do.

a Only 1 ton purchased per annum for use in the post blacksmith shop.

Average cost per post of fuel and forage, etc.—Continued.

MINIMUM RATES.

Inspection districts.	Wood.			
	Hard.		Soft.	
	Cost.	Post.	Cost.	Post.
South Atlantic	$2.95	Fort McPherson, Ga	$2.75	Fort McPherson, Ga.
Middle	3.35	Fort Logan H. Roots, Ark.	2.25	Fort Wayne, Mich.
Pacific	2.10	Fort Spokane, Wash.	1.46	Vancouver Barracks, Wash.
Northern			2.35	Fort Robinson, Nebr.
Southern	1.58	Fort Ringgold, Tex.	2.47	Fort Wingate, N. Mex.
General minimum	1.58	do	1.46	Vancouver Barracks, Wash.

Inspection districts.	Coal.			
	Hard.		Soft.	
	Cost.	Post.	Cost.	Post.
South Atlantic	$4.13	Fort McHenry, Md.	$2.25	Fort McPherson, Ga.
Middle	4.67	Fort Sheridan, Ill.	1.69	Columbus Barracks, Ohio.
Pacific			6.12	Alcatraz Island, Cal.
Northern			1.40	Fort Leavenworth, Kans.
Southern			3.50	Fort Wingate, N. Mex.
General minimum	4.13	Fort McHenry, Md.	1.40	Fort Leavenworth, Kans.

Inspection districts.	Hay.		Straw.	
	Cost.	Post.	Cost.	Post.
South Atlantic	$15.50	Fort McHenry, Md.	$10.64	Fort Monroe, Va.
Middle	7.60	Fort Logan H. Roots, Ark.	4.00	Fort Logan H. Roots, Ark.
Pacific	7.43	Fort Sherman, Idaho.	3.02½	Fort Sherman, Idaho.
Northern	3.21	Fort Riley, Kans.	2.80	Fort Riley, Kans.
Southern	5.80	Fort Brown, Tex.	2.90	Fort Reno, Okla.
General minimum	3.21	Fort Riley, Kans.	2.80	Fort Riley, Kans.

Inspection districts.	Oats.		Corn.		Bran.	
	Cost.	Post.	Cost.	Post.	Cost.	Post.
South Atlantic	$0.89	Fort Myer, Va., Washington Barracks, D.C.			$0.62	Fort Myer, Va. Washington Barracks, D. C.
Middle	.64 32/100	Fort Sheridan, Ill.	$0.52	Jefferson Barracks, Mo.	.55	Fort Logan H. Roots, Ark.
Pacific	.67	Fort Sherman, Idaho.			.47	Fort Sherman, Idaho.
Northern	.48½	Fort Niobrara, Nebr.	.38	Fort Riley, Kans.	.34	Fort Riley, Kans.
Southern	.74	Fort Reno, Okla.	.56	Fort Reno, Okla.	.34	Fort Reno, Okla.
General minimum	.48½	Fort Niobrara, Nebr.	.38	Fort Riley, Kans.	.34	Fort Riley, Kans. Fort Reno, Okla.

REPORT OF MAJ. GEN. WESLEY MERRITT.

HEADQUARTERS DEPARTMENT OF THE EAST,
Governors Island, New York City, September 23, 1897.

SIR: I have the honor to submit report of the operations and affairs in this department since the date, September 16, 1896, of the annual report of my predecessor in command, Major General Ruger.

As my command of the department commenced about the middle of last April, I hesitate to make remarks or suggestions which a longer service in the command may modify.

So far as my inspection of the posts in the department extends, I have found the discipline and instruction of men and officers fully up to the high standard heretofore established in the Army.

I am convinced that an increase of the artillery of the Army is the greatest necessity of the service.

A modification of the instruction and possibly of the character of the small arms of the artillery will, in my opinion, soon be necessary in order that the batteries may have time for instruction in the management and care of the high-power guns which are being established on the seacoast. In this connection I call special attention to the report of the inspector of artillery of the department and also to his report as chief ordnance officer of the department.

The reports of the other department staff officers are complete as to the condition of affairs in their several responsibilities.

Very respectfully,

W. MERRITT,
Major-General, Commanding.

The ADJUTANT-GENERAL OF THE ARMY,
Washington, D. C.

REPORT OF MAJ. GEN. JOHN R. BROOKE.

HEADQUARTERS DEPARTMENT OF THE MISSOURI,
Chicago, Ill., September 25, 1897.

SIR: I have the honor to submit my annual report of affairs in this department from September 15, 1896, to September 25, 1897.

I assumed command of this department on the 11th of April last, since which time I have been absent on various duties about two months.

I would invite attention to the accompanying record of events, which will show in detail movements of troops throughout the department. It will be observed that a large amount of traveling by rail has been done during the past summer. This method of moving troops has been a source of education to officers and men, and, as in our small Army any concentration of troops for any purpose will of necessity be by rail, I regard the educational feature of the movements of the past spring and summer as of great importance not only to the troops, but to the transportation companies as well.

There has been no difficulty in the Indian country. One troop of cavalry has been at the site of old Fort Gibson since February 16 for the purpose of preserving order during the disbursement of funds to the Cherokee freedmen. A troop is still at that point, though I have heard of no difficulties, and there has apparently been no trouble such as was anticipated might occur.

I have been unable to make an inspection of the whole department for many reasons, chief of which has been the delay in the target practice, due to the lateness of the receipt of the revised regulations. This makes it impracticable for me to include my remarks on the whole department in this report. I have, however, inspected Forts Brady and Wayne, Mich., posts occupied by the Nineteenth Infantry. I found the garrisons and the posts in good condition throughout. Many improvements are required at each post, which have been called to the attention of the proper authorities by Colonel Lee, chief quartermaster. The other posts I propose to inspect later in the season. From the reports of the inspectors-general of the districts of which the department forms a part, I am satisfied that the general condition of the troops is excellent. In this connection I would say that our posts require a great deal more in the way of construction, notably Fort Sheridan, Ill. This post has never been completed according to the original plan. This should receive attention, and there should be no efforts spared to put it on a proper footing as regards buildings.

The Indian troop at Fort Sill has been disbanded. The officers who were on duty with it are still there, having charge of the Apache prisoners of war. I regard the presence of officers who know these Indians well and are known and trusted by them as necessary, as well as beneficial in the direction and care of these people. These Indians are still under the care of the Army, and I do not think it would be advisable to make any change, for the present at least. During this year they have furnished some supplies to the quartermaster's department. I would call attention to the reports of Capt. H. L. Scott, Seventh Cavalry, heretofore forwarded, who has them in charge. I desire to commend him and the officers with him for the success obtained, which I have no doubt will continue if they remain in charge.

I would call attention to the recommendations of my predecessor, Major-General Merritt, regarding the necessity for riding halls at the large cavalry posts, and would suggest that riding halls be established at posts where cavalry is maintained at an early date. Gymnasiums and drill halls are also needed at all posts, particularly those in the northern portion of the department—Forts Sheridan, Brady, and Wayne. The maintaining of proper instruction can only be accomplished by continual systematic work, which is impossible at posts without the necessary buildings.

Rifle practice, which was delayed, is now about approaching completion. The competition for the infantry of this department and for the cavalry of the departments of the East and the Missouri is in progress at Fort Sheridan. Reports on this subject will necessarily be delayed.

Work in the lyceum for the past season was carried on according to regulations and orders, and satisfactory progress was reported. The discussion of some military problem or problems was had at each post, and this discussion seems to have aroused more interest and led to harder work on the part of the officers concerned than any other part of the lyceum course. The two months' instruction in photography, given by Lieut. Samuel Reber, Signal Corps, at Fort Leavenworth, was

satisfactory in the main. A synopsis of the lyceum reports from the different posts in the department accompanies this report.

I would again call attention to the discrimination against the clerks employed at these headquarters who were formerly classed under the head of general-service clerks. The matter has been treated in previous reports, and I hope that Congress may now be asked to place these clerks on the same footing as other clerks employed at military headquarters.

I desire to express my appreciation of the value of the labors of the departmental and personal staff, who have maintained their reputation, if they have not added to it.

Very respectfully,

JOHN R. BROOKE,
Major-General, Commanding.

The ADJUTANT-GENERAL, UNITED STATES ARMY,
Washington, D. C.

REPORT OF BRIG. GEN. ELWELL S. OTIS.

HEADQUARTERS DEPARTMENT OF THE COLORADO,
Denver, Colo., September 10, 1897.

SIR: For annual report called for in War Department communication of the 14th ultimo, I have the honor to submit the following:

The number and locations of military posts of the department remain as shown by my predecessor in his annual report of departmental affairs dated September 30 of last year, as do also, with slight exceptions, the number and character as to arm of service of organizations composing their garrisons. Fort Grant has lost two troops of cavalry and gained a company of infantry, making its present garrison to consist of four cavalry troops and two infantry companies instead of six troops of cavalry and an infantry company as formerly; and Fort Huachuca has gained two troops of cavalry and lost an infantry company, having now four troops and two companies instead of its former garrison of two troops and three companies. Otherwise, the character and strength, substantially, of all post garrisons continue as last year reported.

Changes, however, in the stations of particular troop and company organizations, resulting mostly from the interchanging during last October of regiments serving in different military departments, have modified to a considerable extent the personnel of garrisons, especially as regards their infantry portions. The Twenty-fourth Infantry, relieved at Forts Bayard, Huachuca, and Grant by the Fifteenth Infantry, which was drawn from the Department of the Missouri, was sent to garrison Fort Douglas, Utah, on the departure therefrom of the Sixteenth Infantry for the Department of the Columbia, thus effecting complete changes as to the infantry portions of garrisons of four of the nine permanent posts of this department.

The numerical strength of the command in officers and enlisted men, present and absent, was, on June 30 last, 3,396—144 less than on the same date of the previous year. The decrease is mostly due to the transfer of two troops of the Second Cavalry from the headquarters of that regiment at Fort Wingate, N. Mex., to Fort Riley, Kans., in August, 1896, which was made necessary by the burning of the Wingate Barracks. This force is almost equally distributed in the north-

ern and southern portions of the department (its central one-half not having any present army representation), and its permanent stations were determined by conditions which existed at the various periods of their establishment. In most instances these same conditions still dominate, certainly in the South, through Arizona and western New Mexico, where an Indian population, aggregating about 40,000, demands, for the preservation of the public tranquillity, military observance and repression.

Coming to the department very recently, I have not yet had opportunity to arive at conclusions based upon personal inspection regarding particular advantages which special locations offer to meet most successfully the purposes for which troops are maintained in this section, whether it be to assist in the care and control of the large native population under the immediate supervision of the General Government or to aid the civil authorities in the enforcement of law, when they are powerless to execute it unassisted, or to constitute an observing force along our international boundary line. My personal knowledge thus far extends only to the posts in the north, to Forts Huachuca, and Grant with its subpost of San Carlos in the south, and the sections of country which it is necessary to traverse to reach those points. This inspection and inquiry into such attending advantages as would naturally determine the problem of most beneficial troop location demonstrates that, as regards the northern posts, both Forts Douglas and Logan are admirably placed for quartering large garrisons, and bear the impress of permanency. Situated at centers of population and trade, contiguous to competing lines of railways projected in various directions, and furnishing the readiest means for movement of troops if required for speedy use in any part of the country, with superior climatic conditions, and economically maintained, they have all those more essential requirements which well-selected army posts should possess. As to Fort Du Chesne, it serves the single purpose of assisting the civil authorities in Indian control and management, and its importance will terminate with the promised success which is expected to follow the practical application of the Indian allotment laws.

The necessity for the constant military observance and occasional forcible repression of the large Indian population in the southern portion of the department has always determined the stations of its permanent garrisons. They have been abandoned when the improvement of the Indian or his new or abridged localization has rendered their longer maintenance unimportant. Six remain, and the demands which they are expected to meet are to keep this population under proper restraint and furnish assistance to its Government agents when the interests of the civilizing policy pursued require it. Two have lost their importance chiefly because their garrisons have been so reduced that a force adequate to accomplish any decided results in case of Indian hostilities can not be drawn from them. One, Fort Bayard, is considerably east of the line of recent Indian depredations and will gradually cease to be deemed essential, even for the signal object which originally determined its establishment. The remaining three, Forts Apache, Grant, and Huachuca, were wisely located for purposes intended, as they are either in the midst of or near to the abiding places of the most restless and troublesome of the native population, or have quick communication to routes of travel it has been accustomed to pursue when absent from reservations with hostile intent. Forts Huachuca and Grant have vigorously maintained their outlying stations at San Bernardino and San Carlos during the year. The one at the former place has become a cen-

tral point for observation detachments and a border police, while the other, with its single cavalry troop, has given and will continue to give the important agency there situated all the military aid and protection required, or which present indications would denote as needed in the future. This force could be augmented from Fort Grant before any undue excitement could manifest itself in dangerous demonstrations. With this possibility in mind, a recommendation of last year to resurrect San Carlos as an independent post which was referred a short time ago to these headquarters for remark did not receive favorable comment, as such action was thought to be unnecessary in Indian interest and opposed to Army welfare.

But a more comprehensive view of the legitimate and probably future indispensable employment of troops should be taken when determining their permanent stations, than that which concerns mere Indian supervision; and even that hitherto determining consideration as regards post location has recently been affected by modified conditions. With the increase of white population, the growth of communities, the development of business enterprises, the extension of railroads, and that spirit of unrest or desire for change which is apt to incite classes of citizens to unlawful procedure, calls for the assistance of troops for many and varied purposes other than those which concern Indians, and to which troops must respond, are possible; whereas the manifestation of a more quiet disposition on the part of the Indian, and his growing tendency to agricultural pursuits and fixed domicile render him less troublesome. All these possibilities and probabilities should receive due weight when deciding upon sites for permanent posts, and such should be selected as will best enable garrisons to fulfill all expected obligations. The quick response of troops in adequate force when summoned to meet an emergency is very essential to the successful accomplishment of their duties, and some of these Southern garrisons, as now circumstanced, are neither so placed nor have they the strength to satisfy these requirements. However, as my limited inspection of the posts and country in that section does not enable me to arrive at decided conclusions upon this subject it is reserved for more mature consideration and subsequent recommendation. Still, it would appear from personal knowledge already gained that there is need for an efficient garrison at some railroad point in New Mexico, which will admit of speedy communication with all important places along and contiguous to the railway lines of travel, and that the post of Fort Wingate and Whipple Barracks should either have increased garrisons or be abandoned.

Nothing has transpired during the past year to demand the service of troops, either in the enforcement of law or for the protection of citizens, except the raid of the Mexican band of Yaqui Indians into southern Arizona during last August, unless it be the recent call for assistance in the matter of contemplated Zuni Indian arrests, to which reference will hereafter be made. The particulars of the Yaqui raid and the consequent and very efficient action on the part of the garrisons of Forts Huachuca and Grant were fully reported by my predecessor and need no further comment, save possibly a statement of opinion that the recent treaty made by the Mexican Government with those Indians is apparently satisfactory to them and has terminated, for the present at least, the hostility which they formerly cherished. I do not apprehend difficulty from this former source of danger while the Government of Mexico observes its understood existing policy of Indian treatment as applied to these bands, and I think that the settlers along the border live in assured security.

Notwithstanding the unusual quiet which has prevailed during the year, measures to arrest the raiding of the Apaches, should it be resumed, have been pursued continually. Their accustomed routes of passage into Mexican territory after committing depredations have been kept covered, and troops are frequently moving within the limits of their reservation, which lately has been traversed by the cavalry of Forts Bayard and Grant as well as by that of the post maintained in their midst. It would seem that last year's successful efforts of the troops in punishing their small raiding parties, then engaged in the work of robbery and murder, put an end to any inclination on their part to pursue their long practiced lawlessness, and the belief prevails generally that the leaders in their late enterprises were shot last season by the pursuing soldiers. It must be said, however, that the great majority of the Apache tribe is peaceably inclined and is endeavoring, with the assistance of agents, to make permanent settlement on agricultural lands. Many are quite successful in stock and grain raising and have made sales to Government of fuel and forage amounting in value to large sums of money.

The assistance asked for in the Zuni matter, above referred to, is for the protection of the agent and officers of the territorial courts of New Mexico while making intended arrests of some of the headmen of that tribe charged, I believe, under the law of 1885 with the commission of an indictable offense against one of their number. As the Indians to be arrested and thereafter to be removed to place of trial exercise a controlling influence in the affairs of their people, it was feared that the tribe would offer a determined resistance to the officers of the law when the arrests should be attempted. Hence under War Department instructions, issued on the request of the Department of the Interior, the cavalry of Fort Apache and as much of the garrison of Fort Wingate as could be detached were ordered to proceed to the Zuni Agency and protect the agent and territorial officers in the execution of their imposed duties. This force, to the command of which Major Godfrey, of the Seventh Cavalry, has been assigned, was directed to reach Zuni on or before the 15th instant—the date on which, as I have been informed, the arrests were to be made. It will arrive there on the evening of 14th and then be in condition to render all the protection which the civil authorities may require. Report of action of the troops in executing the orders issued for their guidance will be received at these headquarters in a few days, but until then no further information on this subject is obtainable.

Verbal complaints of cattlemen, located on the eastern slopes of the Baboquivari Mountains (a range in southern Arizona and southwest of Tucson), made to Lieutenant Shuttleworth, of the Eleventh Infantry, while engaged in topographical work in that section of the department, and by him reported to the commanding officer of the Huachuca district, to the effect that Papago Indians were constantly stealing their stock, were received at these headquarters on July 26 last. The report was sent back for more explicit statement with such further information as it might be possible to secure, and has not yet been returned. Last winter Mexican authorities at Nogales and Torin telegraphed Colonel Bacon, then commanding Fort Huachuca, that inhabitants of Sonora apprehended a predatory incursion from those same Indians, and requested his interference. Colonel Bacon reported the circumstance, suggesting a visit to the Papago country, which having been approved, he, taking Troops I and K, of the Seventh Cavalry, and a small detachment of Indian scouts, proceeded to the mountains named, crossed the

range, and entered the arid plains beyond. He reported his march and the condition of the Papagoes in part, as follows:

Of these Baboquivari Mountains, very little information could be obtained. They are seldom crossed by white men and never before by United States troops, so far as could be ascertained. The country beyond was found to be a vast plain or valley containing occasional buttes and mountains, and absolutely without water save that found in stagnant pools, which was muddy and fouled by presence of cattle. There are located within the area of this valley, of, say, 40 miles square, about twenty Papago Indian villages averaging three to six or seven families. These villagers cultivate occasionally small patches of wheat or barley, but their chief source of livelihood is raising cattle. The first village encountered was that of Subchief Maguel very near the border line, where I was fortunate in finding an Indian capable of acting as interpreter. Camping near the village, I sent out Indian runners calling upon the various subchiefs and headmen to meet me the next day (February 28), at Chief Pablo's village in the Alvarez Hills. Arriving at this latter place in due time the next day, I saw many Indians assembling, and held council with Chief Pablo and something over a hundred of his principal men. They appeared deeply concerned and alarmed by our presence, following, as it did, so soon after the recent disturbances immediately across the border at El Plomo. I explained to these Indians the friendly relations of this Government with Mexico, stated that no one would be allowed to cross the line with hostile intent, and that it was my duty to make war upon and arrest those who violated the law. They were fully posted as to all that had recently occurred over at El Plomo, viz, that a Papago Indian had been lodged in the Mexican jail and subsequently killed, and that a body of Indians attempting to rescue the one in custody had met defeat, and the loss of three of their number. They positively declared that they had not themselves taken part in the riots nor crossed into Mexico at that time, but claimed that many hundreds, perhaps thousands, of their tribe (Papagoes) resided permanently in Sonora, Mexico, and that the rioters were composed exclusively of these Mexican Papagoes; and further, that since the affair at El Plomo many Papagoes had left Mexico with the intention of going to the reservation and taking permanent residence in Arizona. Some of these refugee Indians were found, and a more stupidly forlorn, ragged, poverty-stricken lot of wretches was never seen. They claimed innocence of participation in the attack, and, having no proof to the contrary, I let them go.

Hearing complaints from American citizens living across the range that these Papago Indians were stealing cattle, I took occasion also to warn them against such transgressions.

The journey, though a difficult one, I believe will result in accomplishing much good, and could not well have been made at any other season for want of water.

The country these people occupy is not theirs. It is off their reservation, but I can not believe any one else will ever want it, and would recommend that they be allowed to remain there as long as they behave themselves.

The most of the Papago Indians within United States territory, of whom there about 600, are fairly well settled upon their reservation 9 miles from Tucson, and have taken land under the allotment laws. It is not believed that they indulge in thieving raids, but it is probable that the portion of the tribe which for generations has inhabited the plains and mountains along the international border increase the scanty subsistence which they are able to gather in the arid lands over which they wander by occasionally appropriating the stray stock of the scattered ranchmen who have become their eastern neighbors.

They have not been accused of committing offenses against the persons or property of white settlers other than cattle thieving. The charge will be more thoroughly investigated later in the season when necessities for the movements of cavalry as regards grass and water can be procured with greater facility.

The foregoing is a summary of, or reference to, the field service of troops during the past year, which is deemed most important, and of which details, with designation of organizations or portions thereof participating, can be found in the attached "Statement of expeditions and scouts," submitted by the assistant adjutant-general of the department, marked appendix F. The statement also contains the particulars of all field duties performed (to some of which I have omitted to allude),

which, taken in its entirety, indicates an active year, especially for the cavalry stationed in the south.

Military instruction as prescribed in orders has been conducted without interruption when the demands of the service did not interfere. Theoretically it was pursued at all posts through lyceums under department direction from November 1 to the end of February. A synopsis of the reports received from post commanders at the termination of the lyceum season and hereto appended exhibits the nature of the instruction given and the work accomplished. By reference thereto it will be seen that those portions of prescribed courses devoted to lectures, the reading of essays, the discussion of actual campaigns, and to a study of the principles of minor tactics through problems assigned for solution with imagined conditions illustrated by map representations, were pursued with interest and profit. This last-named feature of lyceum instruction, which has been recently introduced, and which to a considerable extent has taken the place of the old recitation plan of procedure, has supplied a new incentive to military study and research and relieved lyceum sessions of much of the monotony which formerly attended them. It is, too, accompanied by the further advantage of more thoroughly preparing officers to impart the practical instruction which is now demanded. With regard to that instruction I am of opinion, based upon the personal observation which limited inspection has permitted and the reports of field exercises which are constantly being received, that the requirements contained in General Orders, No. 53, of 1896 from the Headquarters of the Army and which direct the giving up of forty days of the year to the practical solution of problems in minor tactics, are being complied with, and generally in quite a satisfactory manner. The introduction of the course was naturally accompanied with some difficulty, especially in the determination of definite problems for application suited to the varied post conditions as regards character and strength of garrisons and nature of surrounding country, but with growing experience original schemes have been modified or developed and the work intended to be accomplished is progressing favorably. Many of the reports received indicate intelligent criticism of exercises which have been very beneficial to the troops, and a rapidly progressive knowledge on the part of the enlisted men for sketching and mapping those physical features of country which have military significance. All troops of the department have recently made, are now making, or will soon make quite extended practice marches, except the cavalry at Forts Grant and Huachuca which has been obliged to perform a great deal of necessary field service during the past year. These marches offer the best opportunities for field maneuvers and instruction in the principles of minor tactics, as varying topographical conditions are constantly met with, and are taken advantage of by the troops for such purposes. The troops have given a good deal of attention to athletics, to mounted exercises of every character (carrying the latter in some instances, as I think, too far for the benefit of both horse and rider), and have sought to comply with the spirit and intent of General Orders, No. 53, already cited. Very recently they have been engaged in small arms target practice which has been completed, and the directed cavalry and infantry competitions are to be held the latter part of the month. Correct report of the results at target firing have not yet been received, and hence can not be summarized. They will be presented in the annual report of the department inspector of small arms practice, which has been delayed with that end in view.

As previously mentioned, my inspection of posts has been confined, thus far, to Forts Douglas, Du Chesne, Grant, Huachuca, the subpost of San Carlos, with visits to Fort Logan, where the inspection of troops has been deferred for the reason that some portion of the garrison has been absent engaged in target practice at Colorado Springs during almost the entire season. I am unable to make intelligent criticism on the posts of Forts Bayard, Wingate, Apache, and Whipple Barracks, but expect to make the prescribed annual journey to them within a short time.

At all the posts visited my inspections extended to troops, their instruction, discipline and efficiency, to particulars in methods of administration, to buildings, supplies, water advantages or privileges, and sanitary conditions. At all I found organizations well instructed and efficient, and observed in a number of instances marked proficiency in a knowledge of drill regulations, denoting careful teaching on the part of officers. Also expertness in athletic exercises.

The clothing furnished is serviceable and satisfactory, although in the matter of foot wear complaints are heard of the weight and stiffness of the shoe. The troops are very generously subsisted—the articles comprising the ration, which are of excellent quality, being supplemented by large subsistence purchases from exchange profits. Their health has been good. Deducting from the sick list all cases of accidental injury and those in which diseases were not contracted in line of duty, the sick rate continues light. The conduct of the troops (and here I refer to all the troops of the command), if judged by trials, punishments, and desertions, has been measurably satisfactory. An increase at some of the larger posts in summary court trials is observed, also a slight increase in cases brought before general courts. The percentage of desertions to mean enlisted strength which for 1896 was 3.93 is for the year closing with June last 3.58. For more particular information on these subjects, I respectfully invite attention to the annexed reports of the chief surgeon and judge-advocate of the department, and especially to the recommendations therein contained in which I concur.

But again confining my remarks to the posts which I have inspected, I found the quarters of officers in fair condition generally, needing but small expenditures of money (the money has recently been furnished by the Quartermaster-General) to make them comfortable. The barracks at Forts Douglas and Grant are poorly constructed and inadequate, and some of them are much out of repair. Sufficient funds have lately been given the post authorities to make them as suitable for the coming year as they have been at any time in the past; but if these posts are long continued as military stations, new barracks will become a necessity. Fort Du Chesne was constructed to accommodate six companies and has a garrison of two cavalry troops. Slight repairs are needed and the money to make them is available. The same remark as to repairs is applicable to Fort Huachuca, though the buildings are of better construction. All of these posts, with the exception of Fort Du Chesne, have at time suffered on account of inadequate water supply. Improvement in this respect can be made at all. The commanding officer of Fort Douglas is now engaged in perfecting a system which promises improvement. Forts Grant and Huachuca are experimenting and improving their systems and some money, not yet received, with which to purchase material, will be needed to continue the work. Other matters connected with these posts, which might be deemed of

minor importance, and those affairs of posts not yet inspected which require attention, will be communicated at future periods.

The reports of officers having charge of the several staff departments at these headquarters for the fiscal year ending June 30 last are herewith submitted. They show the character and extent of business transacted in the separate divisions of administration and supply, together with all expenditures attending the same, and to them I would respectfully refer for much valuable information not found in this report. Certain subjects which they discuss or mention will probably be brought to the attention of superior authority when a more intimate knowledge of departmental affairs enables me to do so.

Very respectfully,

E. S. OTIS,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL UNITED STATES ARMY,
Washington, D. C.

REPORT OF BRIG. GEN. J. J. COPPINGER.

HEADQUARTERS DEPARTMENT OF THE PLATTE,
Omaha, Nebr., September 1, 1897.

SIR: The following report, submitted in accordance with your letter of August 14, contains a general account of the affairs of the department from the date of the rendition of my last annual report up to the present time, though covering, as regards the business of the staff departments at these headquarters, the year ended July 31. On May 4, 1897, Lieut. Col. James M. Marshall assumed the duties of chief quartermaster of the department, which had been relinquished by Maj. Daniel D. Wheeler on March 17, Capt. Samuel R. Jones acting as chief quartermaster during the interval.

The only change in the troops has been the accession to the garrison of Fort Robinson, Nebr., on August 18, 1897, of the two troops of the Sixth Cavalry, which, under Capt. George S. Anderson, Sixth Cavalry, had been on duty for about five years in the Yellowstone National Park. The march by which this change of station was effected led over a route 639 miles long, and was accomplished without noteworthy incident in thirty-six marching days, men and horses arriving in good condition.

The organizations now serving in the department comprise twenty-four companies of infantry and eighteen troops of cavalry, also the headquarters of three regiments of the former and two regiments of the latter arm. Their distribution among the several posts, as shown in the roster appended to the report of the adjutant-general of the department, I regard as judicious, both from the point of view of their availability for actual service and of their military instruction, the two objects of most importance.

The troops have not been engaged in active operations of any kind the past year. A squadron of the Ninth Cavalry at Fort Robinson, consisting of four troops filled to 60 mounted men each, was, however, actually placed on a train of cars on July 1, with orders to proceed to Hailey, Idaho, 992 miles distant, to protect life and property against Indians, reported as committing depredations in the region known as Camas Prairie, about 20 miles to the northwest. The report upon which, under instructions from the War Department, I directed this

movement came from the governor of Idaho, who named as his informants "the sheriff and settlers." It was embodied in two telegrams addressed to officials in the city of Washington, and in substance set forth that a large number of Indians, supposed to be for the most part from the Fort Hall Agency, and estimated at 300, were burning fences and killing cattle, and that unless speedily returned to their agencies serious trouble seemed imminent.* Fortunately I had, immediately upon being advised by the War Department of the contents of the first of these telegrams, wired the Fort Hall Indian agent, Lieut. F. G. Irwin, jr., Second Cavalry, for full particulars respecting the situation at Camas Prairie, his reply—that from the best information at hand he believed the report of Indian depredations to be exaggerated, if not wholly unfounded—reaching me in time to stop the cavalry, thus saving to the Government the expense of an extensive and unnecessary movement. A detailed report since received from Lieutenant Irwin, who, in order that his investigation might be thorough, visited Hailey and the scene of the alleged disturbance in person, fully confirmed the intelligence he had previously sent me. It showed that in going to the prairie for their winter supply of the camass and other roots growing on public lands and of no use to the white man, the Indians, whose number did not exceed 40, were following a well-established custom of their people, and committed no act that could have alarmed, or actually did alarm, "the settlers;" and that the representations which the latter made to the governor, hundreds of miles distant, without notifying or invoking the assistance of the sheriff and citizens of Hailey, were without substantial foundation, and must have been inspired by improper motives, the nature of which, he pointed out, it was not difficult to surmise. The incident illustrates afresh that reports from settlers of Indian depredations in remote places must be received with great caution.

The instruction of the troops has been conducted systematically and, on the whole, effectively. For this purpose it has been found convenient in this department to allot the period from November 1 to March 31 to theoretical instruction and to such practical exercises only as can be carried on outdoors without discomfort during the winter or indoors, and to reserve the remaining seven months for practical training exclusively.

An account of the operations of the post lyceum appears in an exhibit to this report. Under the present separate classification of captains and lieutenants, officers undoubtedly derive considerable benefit from the recitations held in the more important military branches, especially when the knowledge acquired can be practically applied in the field; interest in the work is also heightened in the cases of those subject to examination for promotion, by the consideration that it prepares them for this test of their professional fitness. But as peace service does not always conduce to the development of independent thought and action, and under unfavorable conditions may tend to make machines of men, I apprehend that the chief value of the lyceum lies in the opportunity it affords every officer to take up for original investigation a military subject of his choice, and to submit the paper embodying the result of his researches to others competent of judging it, for discussion and criticism. Whether this opportunity is, on the whole, fully appreciated and made the most of in this department, I have no means of determining. Under the provision for the publication of meritorious papers by the intelligence division, doubtless intended to stimulate effort in this direction, but one lyceum report was forwarded to department headquarters during the season last past; and this, owing to the sub-

ject it treated, though not for lack of merit, was deemed unsuitable for general publication. To guard against this, in my judgment, particularly valuable feature of the system being stifled by apathy and perfunctory performance, I submit whether it would not be advisable to require a professional paper of an officer but once in two years; such paper after its discussion in the lyceum to be further critically examined by suitable officers senior to the essayist, and the essence of their comments, as revised by the post and department commanders, to be entered in his efficiency report.

Under orders from and upon lines indicated by these headquarters, the theoretical instruction of noncommissioned officers of companies was carried on during the indoor season—mostly under the immediate charge of their company officers—according to plans prepared by the several post commanders and approved by me. Besides the usual recitations in the various manuals for the training of the soldier, instruction was given in the leading principles of the service of security and information and in the elements of orientation and map reading and of military sketching, subjects the importance of some acquaintance with which on the part of noncommissioned officers the exercises in minor tactics which have been carried on in this department the last few years have demonstrated. In the cavalry the branches taught included also stable management, care of the horse, bits and bitting, etc. From the reports of commanding officers I learn that commendable progress has been made in these noncommissioned officers' schools; although it has in some instances been pointed out that instruction in map reading and military sketching was seriously hampered for the lack of a few simple instruments. These, though applied for, the office of the Chief of Engineers did not see its way clear under the law to supply. A suitable provision for this purpose in the next appropriation act would, it seems, be amply compensated for by the increased efficiency of this class of men, upon whom so much depends both in peace and war.

Post schools have been held in accordance with the Army Regulations. I refer you for specific information concerning them to a tabular statement of the adjutant-general. The increased average in the voluntary attendance of soldiers would indicate some revival of interest among them in this work. But I adhere to the opinion heretofore expressed, that all theoretical instruction which military persons are required to undergo should bear a direct relation to their calling. The statement mentioned also shows a falling off in the attendance at the post libraries and reading rooms, doubtless due to the small number of new books that have been received during the year. This circumstance seems to point to the necessity of providing, in the place of the old post fund, a new source of supplying reading matter. Possibly a fixed percentage of the net profits of the exchange might be set apart for this purpose with advantage to the soldier.

To facilitate their instruction, theoretical and practical, the recruits received at the larger posts during the winter season were placed under the charge of a suitable officer and formed into classes or squads, each under a carefully selected noncommissioned officer, and passed from a lower to a higher one according to their manifested proficiency. This system of instruction aims to have recruits prepared to take part in the company drills on the opening of spring. For obvious reasons, it is more rational, and certainly accomplishes better results, than the separate instruction of recruits in the companies to which they are assigned. All that is needed to insure its complete success is that the bulk of recruits be supplied in the late fall or early winter. The quality of the

recruits who joined their regiments during the past year is reported as good.

Included in the winter's practical work were practice marches, covering from 10 to 12 miles, and military gymnastics, forty-five minutes on each of four days of the week being devoted to the latter work; also (during the months of February and March) drills preliminary to target firing, especial attention being paid to gallery practice. The practice marches were generally by battalion (squadron), and, weather permitting, were combined with field movements which had been planned beforehand under the direction of post commanders. Occasionally, the two battalions serving at a post were united for a practice march which occupied the entire day, the midday meal being cooked and eaten while the command was in bivouac. Each company, whether in battalion or regiment, was expected to make such a march once a week, but at times the weather interfered with the execution of it. It was most frequently omitted at Fort Russell, which lies in a district often swept by severe storms during the winter, only eleven marches being performed. The garrison of Fort Meade performed the greatest number of such marches (twenty). Of the nature of the exercises gone through with in connection with both the weekly and the more extended marches, exhibit No. 6 to subreport No. 1 gives particular information.

The character of the athletic and gymnastic drill necessarily varied according to the conveniences available at the several posts. At some no building can be spared or adapted for use as a gymnasium, and at others a sufficient apparatus is still lacking. At posts so deficient the exercises had to be carried on outdoors, and were confined to such as are prescribed in the drill regulations (bayonet, saber, setting-up, mounted exercises) or as are outlined in a pamphlet of which copies were distributed from these headquarters. At each of the regimental posts a suitable officer was detailed to assist the post commander in preparing a plan of instruction and in supervising the execution of it.

In this connection I may be permitted to repeat what in effect I have already had the honor of representing to the War Department. Gymnastics are an important aid to military training, in that they mitigate or remove bodily defects, promote strength, agility, and endurance, and awaken courage, resoluteness, and self-confidence. If this proposition be accepted as true (as it is in other armies), it would seem to follow that the Government should provide the necessary apparatus and gymnasiums. A successful beginning in the supplying of the latter, under the name of "garrison buildings," was made years ago by a former quartermaster-general, who in other respects did much to improve the comfort and efficiency of the Army. Another thing needed to bring about the systematic and beneficial practice of gymnastics is the preparation of a manual of instruction, based upon the above considerations, by officers who have gained an expert knowledge of the subject, and of whom some (medical officers) are competent to fix the limits within which the exercises can be carried on without prejudice to health. Such a manual might well be adopted and published by the War Department, but its requirements need apply only to the foot troops. In my judgment the physical powers of the cavalryman should be developed mainly in conjunction with his mount.

Since April 1, the commencement of the open or summer season, the training of the troops has been regulated, as the regulations contemplate, in accordance with a general plan published in orders from department headquarters. This programme allotted to each tactical

unit in its proper turn a period of appropriate length for its instruction, gave the leader all possible latitude consistent with regulations in the conduct of it, but held him responsible for the result, and set apart as many consecutive hours for the instruction, each week-day except Saturday, as would, with the time required for parades, guard mounting, etc., occupy the forenoon; the object being, by dispensing in the afternoon with all drill except for gun and signal detachments, to leave that part of the day free for administrative work and recreation. No inflexible rules were laid down in the order, or such as would prevent the commander of a post from authorizing deviations from the programme the propriety or utility of which might be indicated by local conditions.

An interesting feature of the summer's work has been the exercises of the troops in minor tactics. These exercises are carried on, under the provisions of the order mentioned, by company (troop), battalion (squadron), and in some cases by regiment. The problem worked out by each unit is in every case formulated by the immediate superior of its leader, whose report, accompanied by the sketches necessary for the illustration of the movement, is forwarded through intermediate commanders to department headquarters. Here the reports are carefully examined, and the several post commanders are informed from time to time of the criticisms, favorable or otherwise, which the commanding general has passed upon them or the movements they describe. They indicate that on the whole this class of work, so different in its character from the routine drill which until within recent years almost monopolized the attention of our Army, has aroused a considerable degree of interest in both officers and men, and that the performance, crude at first, has steadily improved. In passing it may be mentioned that among the sketches turned in were some very creditable ones prepared by soldiers.

At two of the posts (Forts Crook and Meade) the available area has been found to be too restricted for a sufficient variation of the tactical operations in which the higher units take part. This difficulty has been especially felt at Fort Crook, in the vicinity of which the entrance of troops into cultivated and inclosed tracts was naturally objected to by the owners. In such cases the more extensive tactical movements will either be executed in combination with the practice marches ordered for this month or put off until the crops have been gathered, when it is thought the use of stubble fields will be readily granted for the purpose for a small consideration, for which I recommend that the necessary provision be made.

If I found fault at all with the conduct of minor tactical work, I would point out that there has not always or even generally been the amount of discussion of the dispositions that seemed desirable, either on the field, upon the conclusion of an exercise, or in the indorsements transmitting the reports. This defect, I conceive, grows partly out of the lack of experience on the part of our troops, isolated and split up into small fractions as they have been until a comparatively recent date; but it is also believed to be in some measure due to an extreme sensitiveness to criticisms which such isolation has developed in some officers. This feeling will, I am convinced, disappear when the fact is better recognized (as it soon will be) that even experienced campaigners and other officers noted for quickness in forming correct decisions are liable to errors which they are glad to acknowledge.

An accurate account is kept at headquarters and periodically compared with the records of the post both of the number and the kind of the tactical exercises performed by each garrison, in order that the

requirements of the order of the Major-General Commanding the Army relative to the subject may before the end of the calendar year be fully met.

With respect to the working out of problems based upon an assumed situation, according to the leaders' judgment of its requirements, and untrammeled by hard and fast rules, I trust and believe its effect will be to sharpen the tactical understanding of officers and increase their control over their men, besides accustoming them to rapid decision and action. Such work ought not to lead to a slipshod manner of executing movements for which precise and invariable rules are laid down in the drill book. The contrary is likely to be its effect, for the uninterrupted grind the year round in those movements was well calculated to produce surfeit and consequent slackness.

Apart from its value per se, the work of collecting material for the progressive military map of the country to be compiled by the military information division, in which one or more officers from each post are now engaged, will be found to be an admirable preparation for the handling of troops in war, as it will develop that eye for country and that quick judgment of the advantages of terrain which count for so much. Officers fresh from the Academy or one of the service schools are also thus given a chance of applying practically theoretical knowledge there gained. Moreover, their temporary detachment from immediate supervision, coupled with the obligation to look after the wants of men and animals and to render accounts of public property and funds, can not fail to give them a valuable (and nowadays a comparatively rare) experience and to broaden and professionally benefit them.

Here it seems proper to recur to the question of providing mounts for commanders and adjutants of battalions not field or staff officers. That they can not efficiently do their duty on foot can hardly be doubted. Our companies now often turn out for drill fifty or more strong. No one familiar with the facts will contend that four such companies, some or all being in dispersed order, can be properly maneuvered, especially on broken ground, with the chief or adjutant of the command dismounted. In some foreign services even the company leaders are now on horseback. Nothing would seem to be more obvious than that, if any duty requires for its satisfactory performance the service of a mounted officer, it is that of a battalion commander or adjutant, whether in garrison or in the field. The battalion is now recognized as a tactical unit not only by the Drill Regulations, but also by the Army Regulations. A regiment, say the latter (paragraph 226), will be divided into battalions for purposes of discipline and instruction. If the necessity for the mounting of this class of officers is admitted, the act of Congress approved February 27, 1877, amendatory of section 1270, Revised Statutes, would seem to invest the War Department with the power to give officers so employed the pay status of cavalry officers of their respective grades. I am aware that the question has been heretofore adversely decided, but I am inclined to think on insufficient consideration of the facts and the law involved. The least that should be done in the matter would be to secure authority for the proper staff departments to provide the necessary mounts and equipments.

An inspection which I made during July of all the posts satisfied me that on the whole the training of the troops is progressing favorably, that they are in an excellent state of discipline, are suitably and sufficiently equipped for both garrison and field service, are well armed, well clothed, well fed, and as a general rule comfortably quartered.

At the time of my visit of the posts the target practice, delayed under War Department directions beyond the time fixed in the general instruction programme, had only just begun. It has since been completed at all save one of the posts. The weight of opinion, so far as ascertained, is that the conditions under which it has been carried on according to the revised firing regulations approach more nearly those of active service than do the old regulations, and that consequently the revision is based on sound principles. Whether the troops get all the practice in firing they need is, I think, open to question. Doubtless the course prescribed for the regular practice season, including the provision for "field practice," is sufficient. And so may be the amount of ammunition allowed therefor. But the interval between the "seasons" is long, and when we consider that superiority of fire action has become a decisive factor in military contests, it appears to me that ball cartridges at the rate of five rounds per man per month during the intervening months should be added to the allowance; the object being to have the soldier operate his arm so constantly and smoothly that he goes through the operation intuitively and that even the sense of great personal danger will not materially detract from its effectiveness. Like considerations call for an increased supply of blank cartridges, a liberal use of which also heightens the interest in and good effect of tactical exercises.

The magazine gun in the hands of the troops seems to be gradually winning its way into favor. Naturally enough the soldier was slow in conceding its superiority over the Springfield rifle or carbine, for which, though an inanimate thing, he had conceived a genuine affection. But such concession is now generally made. The weakness or insufficiency of some of its parts, such as the safety lock, cut-off, etc., once definitely determined by the rough usage of arms incident to a campaign, can, of course, be overcome and does not affect the value of the system. I gathered, however, that some officers of large experience are still of opinion that a wind gauge would form a valuable addition to the gun. Mechanical appliances, they contend, should whenever practicable be utilized to determine the allowance to be made for drift or wind, as well as the elevation, questions the determination of which by an act of the judgment alone is rendered doubly difficult in the excitement of battle. I have heretofore expressed and still am of the belief that the requirements of the service will be sufficiently met by fitting up a few guns for each company with a wind gauge to be issued to expert shots who may be utilized as sharpshooters in war time.

The consensus of opinion among cavalry officers is understood to be favorable to the recent revision of (embracing no far-reaching changes in) the Cavalry Drill Regulations. Infantry officers are naturally anxious to have whatever modifications are contemplated in the drill regulations of their arm put into operation as soon as possible, the prospect of an early change detracting more or less from the interest manifested in pursuing instruction according to the present system. They recognize that since the future wars of the country will have to be fought, as have its wars in the past, with hastily levied though intelligent troops, and as in modern times more than ever before the initial engagements are likely to have a decisive effect upon the outcome of a war, simplicity of the Infantry Drill Regulations and the omission therefrom of all movements not necessary for the maneuvering of troops in active service, are a necessity. What is deemed to be of paramount importance for infantry is ability to deliver a rapid and telling fire,

cohesive but mobile companies and platoons in compact formation, and the highest mobility of these fighting units under perfect control when in dispersed order.

Under the regulations of the War Department which went into effect on April 30, 1895, a radical change (though perhaps intended to be tentative only) was made in the inspection system of the Army. The officers theretofore attached as inspectors to the staffs of department commanders were relieved from such duty, and the country was divided into inspection districts, not conterminous with territorial departments, to which inspectors-general and acting inspectors-general were assigned, who were placed under the orders of the Secretary of War and the Commanding General of the Army only. These inspectors are not only to "exercise a comprehensive and general observation within their respective districts over all that pertains to the efficiency of the Army," as regards its personnel, materiel, funds, and accounts, but they are expressly charged to report on the "zeal of the commanding officer [post commander] and his ability to perform his duties;" also "whether officers are efficient." This new system has now been in operation more than two years, and though somewhat reluctant to discuss it, and while wishing to emphasize my appreciation of the ability and efficiency of the officer in charge of the inspection district embracing my department, I feel constrained to record the conviction that it has serious defects which make its continuance of doubtful expediency. Chief among these is that it sometimes prevents the commander of a department from getting a full insight into the merits of controversies and other incidents which may arise in his command and in a high degree affect its discipline and efficiency. For not only has the inspector through whom he formerly pursued such inquiries been taken from him, but a clause of the Army appropriation act of August 6, 1894, seems to deprive him of the power to designate for the purpose an officer of his staff, or any other officer save one on duty at the post where the investigation is to be carried on. It is true he may investigate himself; but there are many reasons that must be patent to any one acquainted with military affairs why this is generally impracticable, including the one that upon the conclusion reached by the investigation may depend his action in ordering a court-martial. Numerous cases, in which I felt crippled in the exercise of my functions and authority by this provision, have occurred in this department. Another objection to the present inspection system is that it requires a junior to pass upon the question of the professional fitness, and of the efficiency of the command, of a senior. No one knowing how deeply rooted in the average military man is the sense of power inherent in grade and rank, and how important it is that this feeling should not be impaired, will underestimate the gravity of this objection. It may be said that inspectors were required to report on officers of all grades, including those senior to themselves, under the old system. But the latter viewed them as representatives and mouthpieces of the commanders on whose staffs they were serving and with whom they were in constant and immediate conference. At present inspectors are as a rule far removed from the sphere of personal influence of the high officials under whose immediate orders they are. They occupy the anomalous position of staff officers not on the staff of any commander of troops; a dangerous system, which in the end must tend to weaken the chain of responsibility and command.

It is generally understood that the paucity of officers in the Inspector-General's Department, and the desire to retrench in the expenditure of mileage, were the causes of the adoption of the regulation in question.

But in my judgment the difficulty in the former case could be readily obviated by requiring the adjutants-general of the smaller departments to perform, in addition to their own duties, those of inspectors-general, a requirement which would be strictly based upon section 1130 of the Revised Statutes. Such an arrangement would not only conduce to the general convenience of the service, but would keep the officers of the Adjutant-General's Department, now largely composed of officers recently captains of the line, in touch with the troops, obviously a great desideratum. An occasional interchange in their respective duties between the adjutant-general and the inspector-general of a large department would also be to the professional advantage of both. As regards the saving to the appropriation for mileage, I believe an examination would show that, considering the concentration of troops that is in progress and the greater accessibility of their stations, the expectation of such saving has not been realized.

The report of the chief surgeon shows that the daily ineffective percentage of troops serving in the department (3.84) was somewhat higher during the year reported upon than in previous years. This excess, it is gratifying to learn, was not due to the increased number of admissions to hospital on account of alcoholism, of which there were only 72 as against 144 for the year 1896; resulting, as compared with the latter year, in a gain for duty of 990 days. It is attributed to an epidemic of influenza that prevailed at some of the posts, notably Fort Robinson, also to a gradual increase in the number of injuries, which latter, I am inclined to think, is in turn explainable by the greater extent to which nowadays troops engage in military gymnastics, practice marches and (in the cavalry) mounted exercises. I agree with the chief surgeon in believing that the notable falling off in alcoholism is in some measure traceable to the application of corrective measures, of which the expulsion from the service of confirmed drinkers, either in a summary way or through the agency of a court-martial, is deemed the most effective. The slight increase in the admission rate for venereal disease the chief surgeon accounts for (justly, I think) by the unfavorable surroundings of one of the larger posts. It is a question for consideration, however, whether, though disability from this cause be beyond military control, the loss to the Government that is occasioned thereby might not be lessened by depriving soldiers of pay for the time they are so disabled. It seems to me that a careful perusal of the thoughtful paper of this distinguished medical officer must produce the conviction that a visit of all the posts by the chief sanitary officer of a department as often as once a year is desirable not only for the discovery of defects in the administration of the medical service, but for the getting of that personal knowledge of the medical personnel and the local sanitary conditions at the several stations which is so essential to intelligent action upon medical questions that are submitted to him.

From the report of the judge-advocate of the department, it will be seen that the preceding year's record as to court-martial trials, the best in the history of the department, has been substantially maintained this year. This continued excellent record indicates a steady improvement in the sobriety and deportment of the rank and file. As corroborative and illustrative of this conclusion, it may be mentioned that not a single case of serious misconduct, or such as called for the action of a general court-martial, occurred during the visit the Twenty-second Infantry recently made to Chicago, where it took part in the ceremonial attendant upon the unveiling of the Logan statue.

An investigation which, pursuant to War Department instructions,

was made last April into the subject established, as regards this department, the fact that the present pay system is more economical and in other respects more satisfactory than the one which it superseded, and that a return to the latter would not be advantageous to the public interests.

The recent additions to the barracks at Forts Niobrara and Russell, originally designed for companies of smaller size than those of the present day, have effectually relieved the crowded condition of the men complained of last year and have provided ample air and floor space in the dormitories. A similar condition still existing at Fort Crook in the case of one barrack, occupied jointly by a company and a regimental band, is about to be remedied by the erection of separate quarters for the latter organization. Two double sets of officers' quarters are now in course of construction at Fort Crook, and when completed will obviate the necessity for "doubling up" or for that frequent reassignment of quarters which occasions so much discomfort and ill feeling. At Fort Russell a new guardhouse is greatly needed, the present structure having passed the stage when repair or modification is profitable. Modern structures should also replace at least five of the old frame buildings now used as officers' quarters at this post, and a new building would be desirable there to serve the several purposes of bachelors' quarters, an officers' mess, and an officers' club. The quarters should, however, be divided by a solid wall from the apartments intended for the mess and club, and each set should have its separate entrance and hall, an arrangement of unmarried officers' quarters such as that at Fort Crook, which precludes the needed privacy, being objectionable. At Fort Robinson there is great need for an administration building; also for a gymnasium, the rooms heretofore used for indoor gymnastic exercises being now occupied by troops. Attention is again requested to the necessity of replacing by new structures those of the buildings of the original post of Fort Meade which have become unfit for use or no longer answer modern requirements. In fact, the post ought to be for the most part rebuilt; though, the site being an excellent one, the buildings that have been put up in recent years can doubtless be preserved in a plan of a new post. Among the valuable improvements at posts effected by the labor of troops are the construction of a new rifle range at Fort Russell and the construction at Fort Crook, in rear of the line of targets, of a number of embankments, which have materially added to the safety of the range there.

The exchange system, long the subject of attack, has so far overcome all opposition that few now question its utility as an instrumentality for the promotion of discipline and for the convenience and comfort of all the residents at posts. Besides the changes in the regulations governing the conduct of its affairs that were proposed in my last annual report, I suggest the omission therefrom of the clause which seems to authorize the withdrawal from the exchange of a company at the option of its commander, although the latter may be unable to explain his action to the satisfaction of the commanding officer.

I inclose herewith, and invite your attention to, the reports of the heads of staff departments at these headquarters, all of whom have discharged their duties with ability and to my entire satisfaction.

Very respectfully,

J. J. COPPINGER,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL UNITED STATES ARMY,
Washington, D. C

REPORT OF BRIG. GEN. WILLIAM R. SHAFTER.

HEADQUARTERS, DEPARTMENT OF CALIFORNIA,
San Francisco, Cal., September 23, 1897.

SIR: I have the honor to submit the following report of operations and condition of affairs in the Department of California since the annual report of August 18, 1896.

Pursuant to General Orders, No. 29, current series, War Department, Adjutant-General's Office, I took command of the department May 15 of this year. For the reason that I have been in command but a short time, and on account of the season of the year, I have not made an official inspection of the posts in the department. From my long service in this department and the fact that I have recently been in command of the largest post in it, also the fact that the regiment I commanded garrisons the other posts, I am thoroughly conversant with the condition of the commands as regards drill and discipline, and generally as to the needs of the department.

The progress of the work at Fort Baker and the turning over to the department commander of the armament now in place has made it necessary to establish a battery of artillery there for the care and preservation of the guns. In July last a battery was sent there from Angel Island on temporary duty. This battery should be placed in barracks before the rainy season begins, and recommendations have been made to move there two unoccupied barracks from the Presidio for that purpose.

The approaching completion of a portion of the coast defenses in San Diego Harbor makes it, in my opinion, necessary to replace the company of infantry now there by a battery of heavy artillery. The work of mounting the carriages and guns should be performed by troops, both on account of economy and instruction, and this duty pertains exclusively to artillery troops. This battery should be taken from Angel Island, which would leave there the headquarters, band, and one battery, a force sufficient, at present, for that post.

The large post at Presidio should have for its care and police a regiment of infantry, in addition to the cavalry and light artillery. The heavy artillery now stationed there is exclusively engaged in the care of the seacoast armament at Fort Point and vicinity, and is at present all of this class of troops required. The present garrison of infantry and cavalry can not, without detriment to their proper military instruction, do this work; the light artillery batteries being solely engaged in their especial duties, and two troops of the cavalry squadron being absent about seven months of the year, guarding and patrolling the Yosemite, Sequoia, and General Grant national parks. The garrison, in my opinion, should be augmented, with as little delay as possible, by at least two companies of infantry. This can be done by relieving the company at San Diego and reducing the strength of the post at Benicia by one company, the two companies now there being an ample garrison at that post. There are new quarters at the Presidio already completed for these companies, and there will be no trouble in providing quarters for the officers of two companies of infantry, as a large number of officers are absent. There should be several sets of quarters built at Presidio as soon as the commissary and quartermaster's storehouses, at present in course of construction, are completed. These quarters are the first necessity at that post, and have already been

asked for in a letter forwarded through these headquarters, dated December 30, 1896. If necessary, the brick fort on the south side of the Golden Gate, known as Fort Winfield Scott, can very comfortably quarter the enlisted men of two batteries at a trifling expense in making repairs. Very near the fort are five sets of officers' quarters, built and used as such up to the time the troops were moved from Fort Scott to Presidio. The field officers' set is in good repair and now occupied by a civilian employee; the others are occupied by soldiers' families and need somewhat extensive repairs. These will accommodate five officers.

With the small amount of artillery in this department and the rapidly increasing need of their employment with the seacoast armament, they should be no longer used nor expected to perform the duties of infantry and ordinary garrison duty, as heretofore.

Pursuant to instructions of the Major-General Commanding the Army, dated February 26, 1897, Troop C, Fourth Cavalry, in May of this year, was detailed to guard and patrol the Sequoia and General Grant National Parks, and Troop K, of the same regiment, detailed at the same time for the same duty in the Yosemite National Park. The two troops (B and I) remaining at the Presidio have made a short practice march to Redwood City and return. At the request of the commanding general, Third Brigade, National Guard of California, Troop I, Fourth Cavalry, Captain Lockett, was encamped with the Third Brigade at Santa Cruz from August 14 to 21 of this year. The services of the troop with that brigade have been reported to me as very satisfactory and instructive. All the companies of the First Infantry, except H at San Diego, were ordered to Redwood City and return, by marching, and at that place held their volley firing. Light Batteries C and F, Third Artillery, will go to the same place for their target practice some time about October 1. Neither of these batteries has had any practice for several years. Reports of the target practice of the light artillery, infantry, and cavalry will be forwarded as soon as completed.

It is my purpose to soon assemble all the batteries of heavy artillery in San Francisco Harbor on the Presidio Reservation and at Fort Baker, under the command of the colonel of the regiment, for a period of about twenty or thirty days, for the purpose of a thorough course of instruction in problems of coast defense and the rehearsal of the proposed system of "Fire control and direction" as outlined in the report of the Secretary of War, volume 1, 1896, page 953, et seq.

In April and May of this year, pursuant to the requirements of General Orders, No. 53, Headquarters of the Army, Adjutant-General's Office, series 1896, full time was devoted by the combined arms (infantry, cavalry, and light artillery) to the solution of problems in minor tactics, so far as the limits of the Presidio Reservation permitted, which proved to be highly interesting and instructive for all engaged.

The changes of troops in the department during the year have been as follows: The Fifth Artillery was transferred to the Department of the East, and the Third Artillery to this department, in October, 1896, and, in the same month, a change of headquarters, band, and four companies of the First Infantry from Angel Island to The Presidio.

The discipline of all the troops in the department is excellent.

Number of desertions for year ending August 31, 1897, 55; for year ending August 31, 1896, 58; number of trials by general courts-martial for year ending August 31, 1897, 68; for year ending August 31, 1896, 105; number of trials by summary courts-martial for year ending August 31, 1897, 955; for year ending August 31, 1896, 936.

Officers and men have been zealous in perfecting themselves in their profession; especially is this the case with the Third Artillery, which for the first time has had an opportunity of service with the modern armament. Great benefit is expected from the concentration of the heavy artillery troops and operations in their especial branch, of which full and special reports will be made.

The annual target practice of the heavy artillery was held in June, and was highly satisfactory, full report of which will be found in General Orders, No. 21, current series, from these headquarters.

Four officers, with parties, are in the field engaged in the work directed in instructions from the Adjutant-General's Office, dated April 7, 1897, and another officer will soon be sent out on the same duty. A full report of what has been accomplished by them will be made at the close of the working season.

For the details of the workings of the different departments at these headquarters, attention is respectfully invited to the accompanying reports of their respective chiefs.

Very respectfully,

WM. R. SHAFTER,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL UNITED STATES ARMY,
Washington, D. C.

REPORT OF BRIG. GEN. JAMES F. WADE.

HEADQUARTERS DEPARTMENT OF DAKOTA,
St. Paul, Minn., September 22, 1897.

SIR: I have the honor to submit my annual report, in compliance with directions from the War Department.

Since the last annual report the following changes in the stations of troops have occurred in this department:

Troop G, Tenth Cavalry, from Fort Custer, Mont., to Fort Assinniboine, Mont. Left former post September 21, 1896, and arrived at new station October 10, 1896. Distance marched, 370 miles.

Troop A, Tenth Cavalry, from Fort Keogh, Mont., to Fort Custer, Mont. Left former post September 21, 1896, and arrived at the latter September 26, 1896. Distance marched, 150 miles.

Troop A, Eighth Cavalry, from Fort Yates, N. Dak., to Fort Keogh, Mont. Left former post September 25, 1896, and arrived at new station October 8, 1896. Distance marched, 364 miles.

Troops D and H, Fourth Cavalry, from Fort Walla Walla, Wash., in the Department of the Columbia, to Fort Yellowstone, Wyo., in this department. Arrived in the Yellowstone National Park June 25, 1897, and took station, the former at Lower Geyser Basin June 27, relieving troop D, Sixth Cavalry, and the latter at Fort Yellowstone June 29, relieving troop I, Sixth Cavalry.

Troops D and I, Sixth Cavalry, from Fort Yellowstone, Wyo., in this department, to Fort Robinson, Nebr., in the Department of the Platte. Left Fort Yellowstone July 8, 1897.

PRACTICE MARCHES.

Practice marches were made by troops in this department during the year as follows:

FROM FORT ASSINNIBOINE, MONT.

September 12 to 26, 1896, by headquarters, band, and Troops C, F, and H, Tenth Cavalry, Companies C and E, Twenty-fifth Infantry, one

medical officer and detachment of hospital corps, Maj. Theo. J. Wint, Tenth Cavalry, commanding, around Bear Paw Mountains. Total distance marched, 137 miles.

August 14 to 28, 1897, by Companies C and E, Twenty-fifth Infantry, with one medical officer and detachment of hospital corps, Major Hooton, Twenty-fifth Infantry, commanding, around Bear Paw Mountains, a distance of 150 miles.

FROM FORT CUSTER, MONT.

September 25 to October 9, 1896, by Troops B, E, and K, Tenth Cavalry, and Companies A and D, Twenty-fifth Infantry, Maj. S. T. Norvell, Tenth Cavalry, commanding, to War Mans Creek, about 5 miles from Fort C. F. Smith. Total distance marched, 111 miles.

August 25 to September 9, 1897, by Companies A and D, Twenty-fifth Infantry, one sergeant and three privates Tenth Cavalry, one medical officer and one acting hospital steward, Lieutenant-Colonel Daggett, Twenty-fifth Infantry, commanding, up the left bank of the Big Horn River to Prior subagency and return to post via Billings, a total distance of 159 miles.

FROM FORT HARRISON, MONT.

September 17 to October 7, 1896, by Companies B and C, Second Infantry, with one medical officer and two enlisted men of hospital corps, Lieut. Col. William M. Wherry, Second Infantry, commanding, a total distance of 153 miles.

October 15, 1896, by Companies B and C, Second Infantry, a distance of 13 miles.

December 30, 1896, by Companies B and C, Second Infantry, a distance of 12½ miles.

April 13 to 15, 1897, by Companies B and C, Second Infantry, a distance of 28 miles.

May 19 to 27, 1897, by Companies B and C, Second Infantry, and three men of the hospital corps, to a point near Mitchell, Mont., and return, a total distance of 52 miles.

June 8, 1897, by Companies B and C, Second Infantry, with one Gatling gun, to Helena, Mont., illustrating a formation in putting down a riot. Total distance marched, 9 miles.

August 9 to 14, 1897, by Companies B and C, Second Infantry, and detachment of hospital corps, to Hilger's ranch, Mont., and return, a total distance of 52 miles.

FROM FORT KEOGH, MONT.

September 21 to October 6, 1896, by headquarters, band, and Companies A, E, F, and H, Second Infantry, one medical officer, and three enlisted men of the hospital corps, Col. J. C. Bates, Second Infantry, commanding, to vicinity of Camp Merritt, Mont., and return, a total distance of 184 miles.

April 26 to 29, 1897, by Companies A, E, F, and H, Second Infantry, one acting hospital steward, two privates of the hospital corps, and two privates of Troop F, Eighth Cavalry, under command of Maj. J. H. Smith, Second Infantry, a total distance of 22 miles.

August 22 to September 4, 1897, by Companies A, E, F, and H, Second Infantry, Troop A, Eighth Cavalry, one assistant surgeon, one hospital steward, and one enlisted man of the hospital corps, Major Smith, Second Infantry, commanding, to a point on Spring Creek, between

Hocketts, on Powder River, and Ekalaka, on East Fork of O'Fallons Creek, a total distance of 176 miles.

FROM FORT MISSOULA, MONT.

September 9 to 26, 1896, by headquarters, band, and Companies B, F, G, and H, Twenty-fifth Infantry and detachment of hospital corps, Col. A. S. Burt, Twenty-fifth Infantry, commanding, up Bitter Root Valley and return, a total distance of 145 miles.

November 11, 1896, by Companies B, F, G, and H, Twenty-fifth Infantry, through Bitter Root Valley, a total distance of 10 miles.

November 22, 1896, by Companies B, F, G, and H, Twenty-fifth Infantry, through Bitter Root Valley, a total distance of 12 miles.

FROM FORT SNELLING, MINN.

May 17, 1897, by Companies B, C, E, and F, Third Infantry (Second Battalion), under command of Capt. M. C. Wilkinson, a total distance of 10 miles.

May 18, 1897, by Companies A, D, G, and H, Third Infantry (First Battalion), under command of Capt. Joseph Hale, a total distance of 10 miles.

May 24, 1897, by Companies B, C, E, and F, Third Infantry (Second Battalion), under command of Captain Wilkinson, a total distance of 5 miles.

May 25, 1897, by Companies A, D, G, and H, Third Infantry (First Battalion), under command of Captain Hale, a total distance of 5 miles.

June 26 to August 6, 1897, by headquarters, band, and Companies A, B, C, D, E, F, G, and H, Third Infantry, one medical officer and five enlisted men of the hospital corps, Col. John H. Page, Third Infantry, commanding, to Camp Lake View, Lake City, Minn., for encampment with National Guard, State of Minnesota, and for target practice. Arrived at Camp Lake View July 2, 1897; left there on return march July 31, and arrived at Fort Snelling August 6, 1897. Total distance marched, 144 miles.

FROM FORT YATES, N. DAK.

September 25 to October 10, 1896, by Troop D, Eighth Cavalry, and Companies D and G, Second Infantry, Maj. James N. Wheelan, Eighth Cavalry, commanding, to a point on Grand River, in neighborhood of Deadwood, S. Dak. Total distance marched, 168 miles.

FROM FORT YELLOWSTONE, WYO.

October 10 to 22, 1896, by Troop I, Sixth Cavalry, First Lieut. John T. Nance, Sixth Cavalry, commanding, a total distance of 220 miles.

FIRES.

The only fires of any consequence at posts in this department during the year occurred at Fort Custer, Mont., where, on January 30, 1897, barracks No. 20, occupied by the post exchange, were partially, and on May 9, 1897, building No. 24, occupied as teamsters' mess and billiard hall, was totally destroyed. Cause of fires unknown.

INDIANS.

Camp Merritt, at Tongue River Agency, Mont., a subpost of Fort Keogh, Mont., was garrisoned, as during the preceding year, by detach-

ments of one officer and fifteen enlisted men from the latter post, each detachment remaining at the camp one month and being relieved at the end of that period by another one. However, in consequence of the following narrated events, an additional force has been stationed there since May last.

Information having been received at these headquarters that great excitement prevailed among the Indians at Tongue River Agency and the settlers in the vicinity of the Indian reservation, caused by the killing of a sheep herder, named John Hoover, by Indians, and that ranchmen, anticipating an outbreak of the Indians, were leaving their homes and seeking safety at Miles City, two troops of cavalry from Fort Custer, Mont., were ordered to the scene of the trouble under instructions from the War Department. These troops, A and K, Tenth Cavalry, under command of Capt. Robert D. Read, jr., left Fort Custer May 25, and arrived at the agency on the 27th. Here Captain Read found a large delegation of citizens in consultation with the acting Indian agent, Capt. George W. H. Stouch, Third Infantry, regarding the arrest of the murderer or murderers, who, from all the evidence brought forward, appeared to be Cheyenne Indians, and were, supposedly, members of White Bull's band, located on Tongue River, nearest the scene of the murder. The citizens left the agency shortly after Captain Read's arrival, leaving four deputy sheriffs there to receive prisoners, if apprehended, and collect evidence.

Two days later the acting Indian agent reported that White Bull had given him the name of the murderer, but that he thought it unwise to make the arrest with the force present (two troops of cavalry), and requested that two additional troops of cavalry and one company of infantry be sent to the agency. The murderer, as appears from a subsequent report of Captain Read, was a Cheyenne Indian known as Phillip Stanley (Whirlwind). He confessed the crime, but would not surrender, wishing the deputy sheriffs to come out and take him. In accordance with the agent's request, orders were issued directing Maj. S. T. Norvell, Tenth Cavalry, and one troop of cavalry from Fort Custer and one troop of cavalry and one company of infantry from Fort Keogh to proceed at once to Camp Merritt. These troops left their respective posts on May 29 and arrived at their destination, Major Norvell and Troop E, Tenth Cavalry, from Fort Custer, on May 31, and Troop A, Eighth Cavalry, and Company E, Second Infantry, under command of Capt. John Kinzie, Second Infantry, accompanied by one assistant surgeon and a detachment of the hospital corps, from Fort Keogh, on June 1. Upon arrival of the latter troops, Major Norvell assumed command of all the troops present at the agency, namely, Troop A, Eighth Cavalry, and Troops A, E, and K, Tenth Cavalry, and Company E, Second Infantry.

On the day of Major Norvell's arrival at the agency Phillip Stanley, the murderer, was arrested by the acting Indian agent without trouble and sent under guard of Troop K, Tenth Cavalry, commanded by Captain Read, to Rosebud station, and there turned over to the sheriff of Custer County. Most of the settlers had now returned to their homes, but another stampede was created among them on the Rosebud by a report that two Indians, Yellow Hair and Sam Crow, who were supposed to be implicated in the murder and for whom the sheriff of Custer County had warrants, would resist arrest and had determined to fight. There was, however, no truth in this report, as they were arrested without disturbance by the acting Indian agent and sent under guard of Troop

A, Eighth Cavalry, Lieutenant Morgan commanding, to Rosebud station, and there turned over to the civil authorities.

The prompt action on the part of the military authorities in arresting the culprits seemed to have a salutary effect upon the Indians as well as upon the settlers, as immediately after the second arrests word was received at these headquarters from Acting Agent Stouch that the crisis had passed, and that, in his opinion, Troop A, Eighth Cavalry, and Company E, Second Infantry, could be returned to Fort Keogh, the three troops of the Tenth Cavalry remaining at the agency being all that prudence demanded. The Keogh troops were therefore ordered to return to their station. They left the agency on June 23 and arrived at Fort Keogh on June 26.

Everything being now quiet at the agency, and Major Norvell having reported that there was no longer any necessity for the Custer troops remaining there, orders were issued directing Major Norvell and two troops of the Tenth Cavalry to return to Fort Custer and one troop to remain at Camp Merritt until July 31. These orders, however, were countermanded upon receipt of instructions from the War Department on the subject, and Major Norvell was directed to remain where he was with Troops A, E, and K, Tenth Cavalry, until further orders.

In the meantime the prosecuting attorney and the sheriff of Custer County had continued their investigation into the circumstances connected with the murder, and Major Norvell reported that, as a result of this investigation, three more warrants were issued for Cheyenne Indians, Spotted Hawk, Little Whirlwind, and Shoulder Blade; that the first two mentioned were quietly arrested by the acting Indian agent, sent under guard commanded by Lieutenant Livermore, Tenth Cavalry, to the stage station midway between the agency and Rosebud, and there turned over to the county sheriff. No information of the arrest of Shoulder Blade has been received so far. Major Norvell also reported that Yellow Hair and Sam Crow, previously arrested and confined in jail at Miles City, Mont., had made their escape and had not, at the time of his report, been apprehended, nor had they made their appearance on the Indian reservation, and that, should they return to the reservation, they would be rearrested and returned to the civil authorities. He also stated that a careful investigation made by Captain Read, Tenth Cavalry, discloses the fact that there was no truth whatever in any of the reports which have appeared in newspapers as to hostile acts committed by Cheyenne Indians on or near the reservation.

Upon receipt of instructions from the War Department Major Norvell and two troops of cavalry were on August 11 ordered to return to Fort Custer, leaving one troop of cavalry and a detachment of one officer and fifteen enlisted men at Camp Merritt. Troop E remained at the camp and Troops A and K, under command of Major Norvell, left there August 12 and arrived at Fort Custer on the 14th. Troop E was subsequently relieved by Troop B and rejoined Fort Custer on August 20.

Brig. Gen. John R. Brooke, having been relieved from command of this department, relinquished command on April 10, 1897. From that date until June 14, 1897, all business at these headquarters was transacted under instructions from the War Department, first in the name of General Miles, commanding the Army, and after May 5 in the name of the Secretary of War.

In compliance with the orders of the President I assumed command of this department on June 14 last. On August 13 I left department headquarters and made the annual inspection of posts required by reg-

ulations. All troops were found in excellent condition, well instructed and equipped, and ready for any duty that may be required of them.

Of the eight posts in the department two, Forts Snelling and Harrison (the latter now under construction), may be considered as permanent; one, Fort Yellowstone, being for the protection of the National Park, will probably be a permanent post, but the buildings being frame can only be considered temporary; four, Forts Yates, Keogh, Custer, and Missoula are almost entirely constructed of wood; Fort Assinniboine is much better constructed than the four last named, nearly all of the buildings being of brick, and is in the temporary class only on account of its location, the five having been located and built many years ago as necessity for them arose on account of Indian troubles, the opening of the country to settlement, construction of railroads, etc. Forts Yates, Keogh, Missoula, and Assinniboine are all in fair condition, and with a reasonable amount annually for repairs can be garrisoned for several years. Fort Custer is now in the worst condition of any post I have seen occupied by troops within the past twenty years, and should be either almost entirely reconstructed or be abandoned within the next few months. In my opinion the former course is both impracticable and unnecessary, and I recommend the latter. The water supply at this post has become contaminated from sewerage at the Crow Creek Agency, slaughterhouses, and Indian camps located on the Little Horn above the post. Attention is invited to a special report and the opinions of medical officers on this subject. Fort Assinniboine is the most northern post in the United States. The winters are very long and severe and the time that can be devoted to drills and instruction exceedingly short. This post was probably necessary when it was constructed, but this necessity has long passed, and on account of the hardships imposed upon the garrison I think the troops should be provided for at some other station where the climate is less severe, where they can be kept in better condition and be more available when needed. Fort Harrison is, I believe, nearly ready for an increase of its garrison by two companies of infantry; but complications in regard to water supply have arisen and have been made the subject of special correspondence, which should receive attention before anything further is done in regard to construction.

Attention is respectfully invited to the accompanying reports of the chiefs of the staff departments at these headquarters.

Respectfully,

J. F. WADE,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL UNITED STATES ARMY.
Washington, D. C.

REPORT OF BRIG. GEN. WILLIAM MONTROSE GRAHAM.

HEADQUARTERS DEPARTMENT OF TEXAS,
San Antonio, Tex., September 7, 1897.

SIR: I have the honor to submit the following report of the condition of affairs in this department during the period ending August 31, 1897.

I assumed command of the department under the President's order, No. 34, current series, War Department, Adjutant-General's Office, relieving Col. Samuel Ovenshine, Twenty-third Infantry, on the 17th of June.

MOVEMENT OF TROOPS.

The conditions prevailing during the year have been essentially pacific in all particulars, with the result that nothing in the nature of active service has been required of the troops.

Troop B, Fifth Cavalry, Fort Clark, and Troop C, of the same regiment, Fort McIntosh, exchanged posts by marching.

Light Battery F, Third Artillery, was relieved from and Light Battery K, First Artillery, was assigned to the department by General Orders, No. 43, Adjutant-General's Office, 1896. The former left Fort Sam Houston October 27, 1896, en route for the Department of California, and the latter arrived at Fort Sam Houston October 30 from the Department of the East.

Otherwise the stations of troops are the same as the date of the last annual report.

Practice marches have been made as indicated by the adjutant-general of the department in Abstract A, appended to his report.

The entire volunteer guard of the State of Texas was mobilized at a camp of instruction in the vicinity of this city from July 17 to 25, 1897, to which point, upon request of the governor, I ordered four companies Eighteenth Infantry, band and four troops Fifth Cavalry, and Light Battery K, First Artillery. The camp was regarded as a great success by the State authorities, who have repeatedly expressed the warmest appreciation of the presence of the Regular troops.

SUMMARY OF POST INSPECTIONS.

Accompanied by my senior aide-de-camp, First Lieut. T. R. Adams, Fifth Artillery, I visited Forts Bliss, Clark, and Camp Eagle Pass between the 4th and 11th of August. The weather being unfit, I have postponed my visits to Forts Brown, Ringgold, and McIntosh until later in the season. I inspected the troops at Fort Sam Houston on the 13th of July. The command, consisting of six companies of the Eighteenth Infantry, and the headquarters, band and four troops of the Fifth Cavalry, and Light Battery K, First Artillery, was reviewed and minutely inspected at the barracks, stables, etc. The conditions existing were found to be very good in all respects. I have never seen marching, precision of step, and correctness of distances as observed by the Eighteenth Infantry excelled in perfection by any troops. The troops at this post are joined in a general mess, which is conducted on a plan of the highest degree of efficieney, reflecting credit upon the post authorities and adding greatly to the comfort and welfare of the garrison.

At Fort Bliss the garrison, consisting of the headquarters, band and two companies of the Eighteenth Infantry, and one troop of the Fifth Cavalry, was reviewed and minutely inspected at the barracks, their condition in all respects being found to be very good. The health of this command was good, excepting that nine cases of fever of a malignant type were found in the hospital and reported by the post surgeon to be due, in his opinion, to exposure to the night air in the polluted districts of the towns adjoining the post on both sides of the Rio Grande. The sanitary conditions of the post, such as water, police, cleanliness of the men, etc., are excellent, and would in no manner account for this sickness. The post being on a high mesa, exposed to the purifying effects of strong winds, and having good drainage, and the water being all obtained from two deep wells of 200 and 300 feet depth, respectively, and pronounced to be of excellent quality, would seem to

preclude the suspicion of local causes for this sickness. New screens or canopies over the ranges in the kitchens are urgently demanded as a necessary protection to the excellent and somewhat expensive ceilings to the rooms, which are almost completely exposed to damage by the present condition of the former. The present condition of these canopies will not admit of repairs by the troops. A new building is under construction by contract for use as a subsistence storehouse. The material of which the foundation and upper walls are to be constructed appears to be of excellent quality. The condition of the buildings and the methods in use for the protection and care of the public property were found to be good. A building for use as a gymnasium in connection with the operation of the post exchange is much needed. The post exchange is well conducted. There is a general mess at this post, which appears to be well administered and successful in reaching the desired end, the comfort of the men. A new road between this post and El Paso has been surveyed and estimated for, and, if constructed, will be of great advantage to the public interests on the score of quicker and safer transit.

The garrison and post at Fort Clark were inspected, that of the troops preceded by a review, and found in excellent condition.

The garrison, consisting of the headquarters, band, and four companies of the Twenty-third Infantry, and two troops of the Fifth Cavalry, is in very good condition as regards discipline and police. The troops on account of the heat were not subjected to tactical maneuvers at either of the posts visited beyond such as is embraced in the passage in review, the mounted troops at the increased gaits. These tests exhibited a very good condition of instruction. The conditions existing at Fort Clark in the character of the public buildings are most excellent; the methods adopted for the care and preservation of the public property are the most perfect I have ever seen at any post. The health of this command is excellent; there was but one case of fever of the nature of that described as existing at Fort Bliss. The presence of this disease at this post is attributed to the impure character of the water by the medical officer; and yet the water is obtained from numberless springs at the head of the Las Moras Creek, which are inclosed in a large and deep basin of rock formation, which should be susceptible of absolute protection from contamination by outside surroundings, but the peculiar conditions existing there at the present time appear to have defeated this important result, and innumerable schemes for the improvement of those conditions have been and are still being discussed with a view to a speedy relief. In the meanwhile the water is obtained for the use of the garrison from one particular spring, which is surrounded by a wooden caisson of sufficient height to prevent contamination by overflow from the outside, but this does not completely protect this origin of supply, and therefore it is very important and necessary that a concrete or iron caisson be substituted for the wooden one, and that an iron supply pipe be inserted into the orifice from which the spring emanates in order to insure purity. The scheme is now under consideration and will no doubt soon solve the problem. In company with the post commander, surgeon, and quartermaster I visited and carefully examined into this subject. In my opinion, a concrete caisson, the foundation of which would accommodate itself to the fissures and projections in the rock around this spring, would be better than iron for the reasons stated. The boiler and machinery of the ice plant in the immediate vicinity of the large or main system of springs might be utilized to pump out the water in order that the basin may be thoroughly cleaned,

If practicable, this would seem to be the quickest and most desirable way. A wall should be constructed around the head of this spring, supplemented by a deep ditch outside of it to carry off all surface water and prevent its contaminating that in the spring. The house in which the machinery of the ice plant is supposed to be secured and protected is in a lamentably tumble-down and generally disreputable state, owing to age and decay, beyond repair or remedy, except by tearing it down and building a suitable house for the purpose. This should be done without delay, in the interests in the strictest sense of public economy.

Company D, Twenty-third Infantry, and the post of Camp Eagle Pass were minutely inspected. The condition of the troops as regards discipline was most satisfactory, there being but one prisoner, who was suffering from acute alcoholism. The police of the quarters, storehouses, and grounds was excellent. No drills or maneuvers of any kind were held; the thermometer was at 106° F. The station is a subpost of Fort Clark, and as such under the authority and supervision for all administrative purposes of the commanding officer of Clark.

I returned to San Antonio on the 11th of August.

TRAINING.

Individual and collective instruction in everything appertaining to discipline and drill regulations has been actively conducted during the year at the various posts in the most satisfactory manner.

The importance of athletic and gymnastic training has, from time to time, been emphasized by the department commander, in orders, memorandums, and advisory letters, with the effect of engaging more systematic consideration than has heretofore been given these matters. In the absence of authorized facilities and appurtenances, everything in connection with this important branch of military work has been improvised; it is therefore especially pleasant to report that through the determination and ingenuity of the officers concerned, a satisfactory system has been established, or is in progress of development at every post in the department. Pretty nearly everything possible to unaided inventiveness has been accomplished however, and further progress must of necessity depend largely upon encouragement and material assistance that can only be given by the War Department.

Practical instruction in minor tactics as contemplated by General Order No. 53, Adjutant-General's Office, 1896, has been systematically carried out, and the accomplished results in respect thereof are shown in tabulated form in Abstract C appended to the report of the adjutant-general of the department. This important and instructive work has been considerably obstructed at most of the posts in the department by reason of dense chaparral, intersecting wire fences, cultivated fields and pastures, and prickly shrubs of various descriptions. Similar difficulties apply with still greater force, on account of danger to the inhabitants of the surrounding country, to field target practice as prescribed in the amended firing regulations.

The experience of the year in these particulars has renewed and emphasized the necessity for the establishment in the vicinity of our large permanent posts of practice grounds of sufficient extent to accommodate all arms in combined maneuvers, and to admit of the widest practical exemplification of tactical methods, as nearly as possible, under service conditions. The value attached to such training is too well understood to require discussion, and it is now apparent that something will have to be done at an early day to afford the necessary facilities therefor in this department.

Looking to this end in behalf of Fort Sam Houston, the only post in the command, perhaps, at which actual purchase of ground will be necessary, proceedings were instituted early in the year 1895 with a view to acquiring a large tract in the vicinity of this city. Two boards of officers have examined the tract and declared it to be admirably adapted to all purposes of military training; especial reference having been made to the fact that it affords numerous target ranges in different directions suitable for both light artillery and small arms firing; and to the further fact that the diversified terrain would admit of unlimited scope in the development of all kinds of tactical problems.

The tract consisting of something more than 8,000 acres, is located only 14 miles from San Antonio and at present is offered for only $3.75 per acre, making the total price about $30,000. All things considered it is a most favorable opportunity for the United States to acquire a property which, from a purely military standpoint, would be of inestimable benefit to the service at present, and increasingly valuable with the progress of time.

All the papers in this important transaction are of record in Washington, the last communication in the premises having been forwarded from these headquarters on December 29, 1896.

I should regard my command of this department as especially fortunate if by any action within my power I could attract the favorable attention of the War Department to this significant subject.

In further illustration of the matters touched upon in the foregoing paragraphs, attention is respectfully invited to appended extracts from reports of post commanders.

FORT BROWN RIVER FRONT.

The defensive works on the river front at Fort Brown, described in the last annual report, have been extended and strengthened. They seem up to this time to have been very successful, but are just now being subject to a very great strain.

Just as this report is being completed, the commanding officer reports the river higher than at any time during the past five years, and that although the brush revetments are under water, they fully protect the river bank.

GENERAL SERVICE CLERKS AND MESSENGERS.

Attention is respectfully invited to that part of the last annual report of my predecessor, in which reference is made to the clerks and messengers at these headquarters, formerly known as general service detachment. I have examined the subject in the light of the facts and concur most heartily in the views expressed by the adjutant-general of the department in the report submitted from his office in 1896, and in those embodied in his report for the current year appended hereto. The present condition of these men, under the law of 1894, is certainly worthy of careful consideration with a view to legislation in their behalf.

REPORTS OF DEPARTMENT STAFF OFFICERS.

The following staff officers are on duty at these headquarters and attention is respectfully invited to their complete and excellent reports: Lieut. Col. Arthur MacArthur, assistant adjutant-general; Capt. Frank L. Dodds, acting judge-advocate; Lieut. Col. John Simpson, chief quar-

termaster; Capt. Edward E. Dravo, chief commissary; Maj. Peter J. A. Cleary, chief surgeon; Maj. Francis S. Dodge, chief paymaster; Maj. Clarence E. Dutton, chief ordnance officer, and First Lieut. Samuel Reber, signal officer, who is also temporarily in charge of the engineer office.

PERSONAL STAFF.

First Lieut. Thomas R. Adams, Fifth Artillery, reported for duty under Special Orders No. 129, current series, Adjutant-General's Office, and was duly appointed aid-de-camp on my staff and subsequently appointed to the duties of inspector of small-arms practice. His report of the annual target firing of the troops in the department will be forwarded as soon as practicable after the close of the target season.

First Lieut. George F. Barney, Second Artillery, ordered to report to me for appointment as junior aid-de-camp on my staff has not yet arrived. He will be assigned the duties pertaining to the office of the engineer officer.

Very respectfully,

WM. MONTROSE GRAHAM,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL UNITED STATES ARMY,
Washington, D. C.

REPORT OF BRIG. GEN. HENRY C. MERRIAM.

HEADQUARTERS DEPARTMENT OF THE COLUMBIA,
Vancouver Barracks, Wash., September 14, 1897.

SIR: I have the honor to report the history and administration of this department for the past year as follows: Under General Orders No. 27, current series, Headquarters of the Army, Brig. Gen. E. S. Otis transferred command to Col. T. M. Anderson, Fourteenth Infantry, on May 21. Colonel Anderson continued in command until July 31, when I arrived in the department and assumed command, under the authority promulgated in General Orders No. 44, current series, War Department.

Tranquility has prevailed throughout the department during the entire year, leaving the troops to pursue without interruption the courses of instruction provided by regulations and orders from Army Headquarters. The results, as shown by my inspection of the different posts, are entirely satisfactory. I found the troops in a commendable state of general efficiency and the administration of the various supply departments conducted with economy and efficiency.

For details as to personnel of the department, its educational and professional training, as well as for the fiscal, sanitary, and disciplinary administration, reference is made to the very full appendixes hereto attached and designated by letters from A to H, inclusive. They seem to contain no feature demanding especial comment unless it be that referring to desertion; in this the percentage is reduced from 5.3 to 4.5 per cent of the command, as compared with the previous year. Yet this is by far the greatest evil pursuing our service. It is believed that no other civilized nation looks so lightly upon this crime as ours, affords so little justification for it, or is so indifferent to the consequences it involves, such as the habit of trifling with the national uniform and flag and poisoning the patriotism of the people. Increased

reward for apprehension of deserters and more adequate and effective punishment are earnestly recommended.

DISTRIBUTION OF TROOPS.

The conditions which determined the location of most of the posts in this department have greatly changed, as results of railroad construction and the consequent development and settlement of the country. All questions growing out of our relations with Indian tribes are practically settled. Forts Spokane and Sherman, although comparatively new, may be said to have already fulfilled their missions, and the new post now under construction at the city of Spokane, admirably located at that notable railroad and supply center, will soon be ready to receive the troops thus to be available for its garrison. Fort Walla Walla, an old and popular station, has lost much of its strategical importance, while its defective and inadequate water supply adds another argument for its possible early abandonment. Almost the same remarks may be applied to Boise Barracks. It would seem that in the near future at least one of these should be given up, and possibly the other might be increased in strength for better administration and instruction. Vancouver Barracks, the oldest station in the department, is situated in the strategical center of the region west of the Cascade Range, now traversed in all directions by railroads, as well as a navigable river. Improved means of immediate connection with the railways entering Portland are all that is needed to render this an ideal station for a larger garrison, including all arms.

Forts Canby and Stevens (the latter now ungarrisoned) have been greatly magnified in importance by the recent successful improvements at the mouth of the Columbia, rendering that maritime gateway available to the navies of the world. A larger garrison of artillery troops, equipped with the best of modern armament, should be supplied those and their auxiliary stations at the earliest date possible.

The new artillery post now under preparation near Seattle, in connection with the fresh-water basin proposed in that vicinity for naval vessels, is also a point of equal importance and should be forwarded as rapidly as possible to effectiveness.

ALASKA.

Time not permitting a personal visit to that large and remote portion of this territorial department, I quote the following from the annual report of my predecessor, Brig. Gen. E. S. Otis, for 1896:

My inspecting tours of the present season included a trip to southeastern Alaska. Very little official information concerning that Territory, which forms a portion of this department, has been obtained at these headquarters since the final withdrawal of troops therefrom in June, 1877, when its public property was turned over to the Treasury Department and all military control over its affairs terminated. A fair estimate of its white population, if that element which employs its summers within it and returns south to remain during the winter months is counted, would place its number between 7,000 and 8,000, about one-half of whom are engaged in mining and the remainder in trade and fishing. Possibly one-fourth of its white inhabitants are on the Yukon River and tributaries. The most reliable data shows its native population to be about 27,000 (10,000 Indians and 17,000 Eskimos), and 5,000 of these Indians dwell in the southeastern part of the Territory below Mount St. Elias.

Until 1884 the Territory was without a civil government. The rather anomalous Congressional act of that year which organized it into a district, which provided for it executive and judicial establishments but withheld all legislative power and representation from its people, which still continues in force without modification except that provision has been made whereby acquisition of land may be secured for business purposes, was adapted to its conditions at the time and has worked

more satisfactorily than the former methods of control when it was in fact an outlying province of the United States without political autonomy of any character. With increase of population and the development of business interests, the people desire a code of laws better suited to their present status than the one now sought to be enforced and which is drawn from those general laws of the United States and of the State of Oregon applicable to their existing conditions, supplemented, in cases in which those general laws do not apply, by the practical employment of such legal maxims as the district judiciary believes that remedial action demands. They have no wish to seek this code through the legislative assembly of a territorial organization, for that would impose individual expense and burdensome taxes, but rather through such Congressional legislation as a permitted representative in Congress might advise and urge as necessary for their welfare. It is possible that an act granting this desired representation without taxation would be no greater departure from the uniform practice of supplying civil government for United States territory than was the law of 1884 which created the district; and doubtless its representative, chosen by the people, would understand and could more efficiently demonstrate and successfully secure the measures of relief or assistance hoped for than any party, power, or means which, under prevailing circumstances, is available.

Since the passage of the act of 1891, which to a certain extent gave relief in the matter of individual land title, the objections made to the present code, aside from assertions of its insufficiency for the growing communities and increasing industries of the district, are more particularly addressed to its strictly prohibitory features regarding the timber of the country and the introduction and sale of ardent spirits. Neither of these provisions have been, nor can be, rigidly enforced. As to the first, the people ask that it be at least so far modified as to permit the free use of the forests by the manufacturing enterprises of the district and for domestic purposes. The second is especially difficult of execution. The Army and the Treasury Department endeavored for fifteen years to carry it out, but only measurably succeeded. The judiciary of the district, backed by the civil power of the country, by the customs authorities, and by assistance from the Navy, has failed to apply the needed restraint, although aided by the more intelligent and best-intentioned citizens its efforts for repression have been more effective than any which preceded them. The only practicable remedy for the evil is believed to exist in an exchange of prohibition for high license, summarily revocable for forbidden action, when all who avail themselves of the right under the law to trade in liquor will be pecuniarily interested in conducting a strictly legal business and in suppressing illicit traffic.

Under the present and long prevailing condition the native population, if it has not retrograded certainly has not advanced, notwithstanding notable exceptions of marked improvement are in evidence to sustain a contrary opinion, and when under the influence of intoxicants, for which it barters freely every available commodity, it has been quite threatening in its unfriendly demonstrations and difficult to control. Probably the presence of the marine detachment at Sitka prevented an outbreak of the Indians there a short time ago, and occasional manifestations of hostile intention on their part has given some importance to the request of citizens for the permanent establishment of a body of troops in their midst. The civil and educational authorities of the district, however, say that troops are not required in southeastern Alaska either for protection or any other purpose, but forcibly assert that they are quite necessary on the Yukon River near the international boundary line where mining interests are extensively conducted. They say that the Dominion of Canada is represented in that section by its mounted police, while on our side of the line the United States has no legally organized force to impose restraint nor protect its inhabitants. To be sure, the civil jurisdiction established by the act of 1884 is coextensive with the entire Alaskan territory, but the means provided are not adequate to give it that practical extension which recently developed conditions in the Yukon country demand.

In considering such a disposition of troops it is difficult to understand what use could be made of them unless some special legislation should authorize their employment. The law which created the mounted police of Canada vested it with certain well-defined criminal jurisdiction, with power to punish by imprisonment for specific periods of time. Unaided it can apply all the police regulations necessary to insure the peaceful conduct of a community. But the Army can not exercise authority of such a nature. The act of 1878 makes it unlawful to employ any part of it "as a posse commitatus or otherwise for the purpose of executing the laws, except in such cases and under such circumstances as such employment of said force may be expressly authorized by the Constitution or by act of Congress." Troops stationed on the Yukon might repress an Indian outbreak, but that is unlikely to occur, as the natives of that section are too few in numbers, too much scattered, and too poorly equipped to engage in any serious disturbance, even if so inclined. Further than this, legitimate occupation for the troops would be wanting. They could not engage in an attempted enforcement of the prohibitory measures of the law of 1868 in respect

to firearms, ammunition, and distilled spirits without special authorization, and administration in such matters has been given to the civil government provided for the district. Under existing conditions, then, no beneficial results could be expected from the service of troops in the interior of the Territory, and as the civil authorities do not need their aid in its southern and more populous sections, their presence in Alaska is not required. Still, I do not understand nor believe that an armed force is not essential for the safety and prosperity of its inhabitants. The Navy and Treasury vessels which ply its waters, and the excellent marine detachment at its capital enable the civil power to hold the natives in check and to signally obstruct lawlessness on the part of its large floating white population.

The foregoing presents many difficulties in the way of a successful use of troops for any purpose in Alaska, under conditions existing a year ago. To this date no legislative action has been had to improve the situation in that respect. Meantime the discoveries of gold mines of almost fabulous richness along the tributaries of the upper Yukon have already added several thousands of miners and speculators to the white population of that region, with the prospect that many more thousands will go there with the first opening of its waterways and trails next year. While most of the mines so far developed are in the jurisdiction of the Dominion of Canada, the mineral region includes both sides of the international line and all routes of travel to and from it lie across our territory, while their many difficulties of transport and supply will insure points of congestion where large numbers, perhaps thousands, of people will be stranded under circumstances especially calculated to promote disorder and require the restraint of some form of competent executive authority. This subject seems therefore to demand the immediate attention of Congress. Should the prospective emergency fail to be met by early legislation, it is almost certain that executive action under some form of military government will become an absolute necessity.

Very respectfully, your obedient servant.

H. C. MERRIAM,
Brigadier-General, Commanding.

The ADJUTANT-GENERAL UNITED STATES ARMY,
Washington, D. C.

REPORT OF THE COMMANDANT OF THE CAVALRY AND LIGHT ARTILLERY SCHOOL.

CAVALRY AND LIGHT ARTILLERY SCHOOL,
Fort Riley, Kans., September 1, 1897.

SIR: I have the honor, in compliance with paragraph 10 of the school regulations, to submit for the information of the Major-General Commanding the Army, a report of the progress and wants of this school.

The school year begins January 10 and closes December 30, consequently the submission of the annual report on September 1 necessitates reporting at a point in the progress of the year's course of instruction some months prior to the close of the preceding school year.

The instruction of cavalry from September 1, 1896, to the end of the [illegible] October was conducted in the school of the squadron, regimental and field exercises, a detailed report of which will be found in the report of the director of the cavalry subschool, hereto appended and marked A. During this period the artillery was drilled in the school of the battery and battalion, and in practical problems preparatory to combined field exercises.

Early in October a battalion of six companies of infantry and one squadron of four troops of cavalry from Fort Leavenworth arrived at the post and the remainder of the month was devoted to field exercises with the three arms combined, and after the departure of the Fort Leavenworth troops for their proper station, exercises were continued with the regular garrison, together with target practice for artillery.

A special report covering that part of the course in detail was submitted to the War Department December 1 and is hereto appended. Attention is respectfully invited to the recommendations contained therein relative to the assembling of troops on this reservation, annually, for these exercises. Preparatory drills leading up to the solution of problems for the three arms combined can be held at other posts, but it is believed that the beneficial results of thus assembling troops more than justifies the small expense attendant thereon.

I am at present under orders to send a squadron of cavalry and one light battery to the encampment of the Grand Army of the Republic at Topeka and Leavenworth, which will necessitate their absence from the post from about September 20 until the last week in October, thus precluding the possibility of having any important combined exercises of the cavalry and artillery until November. The weather in this section is then very uncertain and at times disagreeable. The course of instruction is progressive and leads up to this work as a practical test of the efficiency of officers and men as a result of the year's training. It is therefore earnestly suggested that this be borne in mind and that except in cases of an emergency the troops be not detached from this school during the autumn months.

Beginning January 10 and continuing throughout the winter months instruction was continued in the riding hall, in athletics and gymnastics, according to the schedule adopted by the school staff. During this period officers were assembled, in compliance with regulations, for recitations and reading of essays twice a week in the post lyceums, one hour being devoted to the former, after which the classes were combined in the lecture rooms and an essay read. The progress and results were satisfactory.

Instruction to noncommissioned officers and selected privates was given, theoretically and practically, during this period in reconnaissance, sketching, outposts, advance and rear guards, elements of field engineering, drill regulations, and to those of the artillery, in addition, special duties applicable to that arm.

A series of lectures by the veterinary surgeon on hippology, and theoretical and practical instruction in horseshoeing by the chief farrier were also given with very satisfactory results.

The system has been adopted of giving to such of these men as were deemed proficient parchment certificates, which it is believed will have a beneficial effect. Attention is respectfully invited to the report of the instructors appended as an inclosure to the report of the director of the cavalry subschool.

With the opening of spring, drills were resumed in the open, and the troops and batteries carried regularly through the school of the squad, troop, squadron, battery, and battalion. Instruction was also given in signaling, packing, manuals, and athletics. The organizations have also been instructed in the duties of litter bearer as required by orders.

In conformity with General Orders, No. 53, Adjutant-General's Office, series 1896, field exercises, since April 1, have been held for cavalry and artillery separately once a week (with the exception of a temporary suspension during July owing to excessive heat), the work progressing

regularly through the subjects embraced in minor tactics. These exercises are still in progress and will be continued, together with regimental drills, until one squadron starts on its practice march to Leavenworth, via Topeka.

During the field exercises above referred to signaling was conducted practically by establishing a home station and another at the water tower, with orders for troops on the various roads to locate a heliograph station on some prominent point in sight of the water tower and have messages transmitted. In this way communication at distances as much as 5 miles has been had.

Owing to the delay in receiving the firing regulations target practice for the cavalry was not held until later than scheduled. The second squadron was in camp during the month of July for this purpose and the first squadron during August. In these two months the two squadrons were practically instructed in all the duties pertaining to camp life.

Since my last annual report the company of instruction of the hospital corps has been broken up.

A jumping chute for training horses has been constructed, but was completed too late to be utilized in connection with riding-hall instruction last winter. It will be of great value in future, as practical experience has shown that it makes clean, fearless, and safe jumpers of horses over various obstacles.

The school received this year an appropriation of $2,000, which will enable it to be supplied with much material that is absolutely necessary and begin the equipment of a professional library, thus filling a long-felt want and affording officers facilities for professional study. It is earnestly recommended that this appropriation be continued from year to year.

An accurate topographical survey of the reservation and the construction of a contoured map is now in progress, which, when completed, will be of inestimable value to officers in the school exercises. First Lieut. M. M. Macomb, Fourth Artillery, has the work in charge. He is particularly well fitted for this duty.

The buildings the construction of which was authorized from the appropriation made for this post last year are now nearing completion and are in keeping with others at the post.

The school has, since my last report, lost the services of a most valuable assistant by Lieut. Col. L. H. Carpenter, Seventh Cavalry, being separated from it by reason of his promotion. He has been identified with it for a number of years, and its success is largely due to his earnest and able work.

He has been replaced by Lieut. Col. A. R. Chaffee, Third Cavalry, as director of the cavalry subschool.

I particularly invite attention to the following recommendations relative to the school, some of which are renewed:

The post should be supplied with an electric plant for lighting the buildings and streets. It would be cheaper than the present method and far more satisfactory.

In order to complete the post as contemplated (twelve troops of cavalry and five batteries of light artillery), there should be erected in the main post a barrack for the band, four stables for troop horses, six sets of cavalry lieutenants' quarters, a veterinary hospital, and paddock.

In the artillery subpost will be required two sets of barracks, four double sets of artillery lieutenants' quarters, and three gun sheds.

The above-mentioned buildings are absolutely necessary in case it is proposed to increase the garrison to the size originally contemplated.

At one time during the past year so many officers were detached from their troops in the cavalry post that I felt it necessary to call the attention of the War Department to the fact, and request that additional officers be sent here, as the proper instruction in the course as scheduled was being seriously interfered with.

It is earnestly requested and recommended that a full complement of officers be kept on duty at this school, and in case an officer is detached for any length of time he be immediately replaced by transfer.

The post should be supplied with a first-class ice machine. The records show that in six out of the past ten years the natural ice crop has failed totally or partially. All ice for the post for the past two years has been procured by purchase and shipped here at considerable expense and waste.

Should it be the intention of the War Department to increase the garrison to the strength originally contemplated (twelve troops of cavalry and five light batteries of artillery), it is recommended that the cavalry command consist of three squadrons from different regiments, and that one squadron be relieved each year, thus making the tour of duty three years. The troops of the squadron relieved, on going to other posts, would be in a condition to disseminate the practical knowledge obtained at this school to the remaining troops of its regiment.

This change should be made about December 1 of each year, as the new squadron would then begin its duties in the school at the commencement of the school year.

At present but two cavalry regiments are represented at the school (six troops of the second and two troops of the first constituting the cavalry command).

It is believed that it would be a wise provision to send graduates of the Military Academy (assigned as additional lieutenants to the cavalry branch) here for the first year of their service, or at least until they are permanently assigned to regiments. They would undoubtedly derive much greater benefit from duty here for a short time, with a large command possessing exceptional facilities for instruction, than at the ordinary post.

The construction of a suitable building for their accommodation, as well as for all bachelor lieutenants, would be a desirable feature, and would involve much less expense for construction than would be necessary in building separate quarters.

Attention is especially invited to the report of the director of the artillery subschool relative to a larger supply of ammunition for target practice. The range here is exceptionally fine, and every facility should be afforded for this important instruction.

Two letters have been written requesting that two Berthon collapsible boats be furnished the school for experimental and practical purposes during the combined field exercises. Photographs with descriptions were sent to the War Department December 21, 1895, and application for the boats renewed January 23, 1897. No reply has ever been received. It is respectfully requested that these boats (which can be purchased at a low figure) be furnished.

Attention is particularly invited to the report of the director of the cavalry subschool relative to the school of instruction for cavalry recruits. The training of the recruit is systematic, thorough, and progressive, under an efficient officer. These young soldiers go to their troops, after passing through the school, fully prepared to enter upon their

regular duties without having to learn so many things that discourage them in the first few months of their enlistment. It is recommended that I be authorized to appoint three noncommissioned officers in the skeleton troops of my regiment for permanent duty in the recruit school as instructors, their warrants to be canceled when the present regimental headquarters change station, the authority to be transferred to the incoming headquarters.

Very respectfully,

A. K. ARNOLD,
Colonel First Cavalry, Commandant.

The ADJUTANT-GENERAL UNITED STATES ARMY,
Washington, D. C.

REPORT OF THE COMMANDANT OF THE UNITED STATES INFANTRY AND CAVALRY SCHOOL.

UNITED STATES INFANTRY AND CAVALRY SCHOOL,
Fort Leavenworth, Kans., June 30, 1897.

SIR: I have the honor to submit the following report of the operations of the United States Infantry and Cavalry School for the second school year, commencing September 1, 1896, and ending with the graduating exercises on June 15, 1897.

The student class which completed the course at the school was composed of the following-named officers:

Second Lieut. William M. Crofton, First Infantry; Second Lieut. Peter E. Marquart, Second Infantry; First Lieut. John C. Gregg, Fourth Infantry; First Lieut. Paul A. Wolf, Fourth Infantry; Second Lieut. Guy H. B. Smith, Fourth Infantry; Second Lieut. John F. Madden, Fifth Infantry; Capt. Edgar Hubert, Eighth Infantry; First Lieut. James R. Lindsay, Eighth Infantry; Second Lieut. John F. Stephens, Tenth Infantry; First Lieut. Willis Uline, Eleventh Infantry; Second Lieut. Herbert O. Williams, Eleventh Infantry; First Lieut. William N. Hughes, Thirteenth Infantry; Second Lieut. George McD. Weeks, Fifteenth Infantry; Second Lieut. George D. Guyer, Sixteenth Infantry; First Lieut. James T. Kerr, Seventeenth Infantry; Second Lieut. Joseph Frazier, Nineteenth Infantry; First Lieut. Frank D. Webster, Twentieth Infantry; Second Lieut. Robert W. Mearns, Twentieth Infantry; Second Lieut. William M. Morrow, Twenty-first Infantry; Second Lieut. Orrin R. Wolfe, Twenty-second Infantry; First Lieut. John R. M. Taylor, Twenty-third Infantry; Second Lieut. Thomas F. Schley, Twenty-third Infantry; Second Lieut. Harrison J. Price, Twenty-fourth Infantry; First Lieut. Vernon A. Caldwell, infantry (unassigned); Second Lieut. George P. White, Third Cavalry; Second Lieut. James H. Reeves, Fourth Cavalry; Second Lieut. Powell Clayton, jr., Fifth Cavalry; First Lieut. John M. Stotsenburg, Sixth Cavalry; First Lieut. Edward Anderson, Seventh Cavalry; Second Lieut. Frank Tompkins, Seventh Cavalry; Second Lieut. George W. Kirkpatrick, Eighth Cavalry; First Lieut. Charles J. Stevens, Ninth Cavalry; Fist Lieut. William H. Smith, Tenth Cavalry.

The class originally reported with thirty-five members. Of these officers one was relieved from duty at the school to enable him to accept position as regimental quartermaster and one was found incapable of completing the course.

The class has shown ability, and through its efforts progress has been attainable in the development of the school.

The following-named officers are recommended by the staff to be declared "honor graduates" of the school: First Lieut. Edward Anderson, Seventh Cavalry; Second Lieut. Guy H. B. Smith, Fourth Infantry; Second Lieut. Herbert O. Williams, Eleventh Infantry; First Lieut. William H. Smith, Tenth Cavalry; First Lieut. James T. Kerr, Seventeenth Infantry.

For a synopsis of the work done in this last year attention is invited to the accompanying report of instructors in charge of the several departments.

CHANGES IN SCHOOL REGULATIONS.

After mature deliberation it has been determined to submit for approval a revision of the regulations, by which it will appear that some important changes are recommended, chief among which is the proposed plan of doing away with the department of infantry, the department of cavalry, and the department of artillery, and consolidating these with the department of military art, as suggested in my annual report for 1896. If approved and authorized, the school will then be divided into five departments instead of seven, as now constituted, and they will be known as the departments of tactics, strategy, engineering, law, and hygiene.

The proposition has been discussed to do away with the department of law, because its course is much of a repetition of that gone over at the Military Academy or required from candidates for promotion.

It is contemplated, however, to gradually enlarge this course on the lines indicated in my last annual report, by citing for solution supposable cases in international questions which might require immediate action by an officer. It is also intended to intrust this department with the kindred subjects of military administration, embracing all the business departments, quartermaster, commissary, and ordnance, and to develop something of their practical features in problems of rapid supply during supposed active field operations.

MOUNTS FOR STUDENT OFFICERS.

Fortunately for cavalry officers detailed in the next class, transportation is to be furnished by the Government for their horses from present station to Fort Leavenworth, so that for the large amount of work to be done in the saddle during the school course the cavalry officer will have the benefit of a mount to which he is thoroughly habituated. Under existing conditions the infantry officer has to depend upon the cavalry troops stationed at Fort Leavenworth, and it is not always practicable to furnish the same mount daily. This results in trouble all around—to the student officer, to the troop commander, and to the soldier whose horse is taken for such extra work. Attention is invited to the following remarks, taken from the report of the instructor, department of engineering:

> Another recommendation I would make is with reference to horses. The proposed school regulations contemplate a more extended course in mounted work in the subjects covered by the department of tactics, and it is believed that this department would be much benefited as well were it practicable for each officer to have his own horse for use on duty. Two methods of attaining this suggest themselves. The first is to have a school detachment of horses and men. Thirty horses and a detachment consisting of two noncommissioned officers and ten enlisted men, to be known as the United States infantry and cavalry school detachment of cavalry, would be

ample for the purpose. The secretary of the school could command the detachment. The men need have no arms issued to them, and when not required for other duty they could be used as a police detachment for the school and arsenal grounds, thus relieving the garrison troops of much fatigue duty. They could be assigned to the companies serving at the post for quarters and rations.

The second method, and probably the more feasible one, would be to transport the horses of mounted student officers from their stations to the school, to give each infantry officer (instructor and student) mounted pay and forage during his course, and then require all to ride their own horses.

The subject is one worthy of serious consideration, and I believe one or the other of the above propositions would be of distinct benefit to the school. Mounted work would then be carried on more assiduously, because the heads of departments would have no hesitation in making use of the horses more frequently than now, when each animal is assigned to and ridden by a trooper as well as the student.

NECESSITY FOR INCREASE OF MONEY ALLOWANCE.

Attention is invited to the following remarks, taken from the report of the instructor, department of engineering:

One of the greatest needs of the school at the present time is a more liberal appropriation for its support. The department of engineering has received its full share of the $1,500 annual allotment to the school, and yet it has been impossible to furnish all the instruments and material desired.

There is urgent need, in order to properly carry out the course, to begin September 15, 1897, of another surveyor's compass and a wye-level, as well as a Saegmuller solar attachment for the transit, also a complete outfit (40 each) of steel rulers and triangles. Many of the smaller instruments, such as clinometers and compasses, have been in use for a number of years and should be replaced by new ones. It is estimated that $450 could be judiciously expended at once on new instruments beside that necessary for the ordinary repairs incident to two years field use.

The following is a list of instruments, the use of which is taught both practically and theoretically: Chains, steel tapes, scales of equal parts, odometers, engineer's transit; same, with stadia wires, etc.; same, with solar attachments; compass, surveyor's; compass, box; compass, prismatic; protractors, plane table, wye-level, slope board, leveling rods, sextant; range finders, Pratt, Green, Gordon, Labbez, Weldon (two forms), Souchier, Watkin; tallying register, clinometer, field sketching case.

Instruments taught only theoretically: Wheelbarrow odometer, pedometer, cyclometer, aneroid barometer.

All cameras, lenses, and other attachments used in photography are taught both theoretically and practically.

All student officers are required to become familiar with the principle upon which each instrument is constructed and to practically apply in the field what is learned in the section room. This involves the frequent use of large numbers of the instruments and incidentally the repair or purchase of new ones.

The constant purpose of the department is to increase practical work and, if this is not to be discouraged, the increase of cost must be met.

There can be no doubt that work in the field with the instruments is essential and that no amount of mere theory will take its place. The students are required to both learn and practice, and this is done with the approval of the War Department.

Were there no student officers, no extended course of topography, and no practical use of instruments in military surveying, the Infantry and Cavalry School would be surprised to find itself allotted the second and larger share from a lump appropriation for the three service schools. But the student officers are detailed, they are all required to become proficient in the course and there is constant practical use of expensive instruments, yet the Infantry and Cavalry School receives $3,500 less than Fort Monroe and $500 less than Fort Riley, where there are no

student officers and consequently no practical application of a previously studied theoretical course.

If the performance of ordinary garrison duty with incidental drills and field exercises constitutes a service school, then there are two service schools at Fort Leavenworth, one established by regulations and known as the Infantry and Calvary School, and the other constituted by the presence of a larger number of organizations than are at any other post in the Army and doing practical field work with the post proper and with the Infantry and Cavalry School.

The request for greater allowance of funds is earnestly renewed.

LIGHT BATTERY.

In practical field exercises, during which the whole enlisted force of the garrison is officered and controlled by student officers under the observation of the instructors, it is impracticable to make the imaginary presence and maneuvering of field batteries at all correspond to what would be the case in the actual use of rifled guns.

If a field battery with its entire personnel can not be stationed here, it is requested that necessary action be taken to provide six of the modern guns with necessary equipment and harness, and that forty-eight horses be furnished for the field work.

Very respectfully,

H. S. HAWKINS,
Colonel, Twentieth Infantry, Commandant.

The ADJUTANT-GENERAL UNITED STATES ARMY,
Washington, D. C.

REPORT OF THE COMMANDANT OF THE UNITED STATES ARTILLERY SCHOOL.

UNITED STATES ARTILLERY SCHOOL,
Fort Monroe, Va., August 31, 1897.

SIR: I have the honor to submit the following report of the Artillery School for the year ending August 31, 1897:

The following officers reported to the commandant on September 1, 1896, and constitute the present student class:

First Lieuts. H. R. Lemly, Third Artillery; E. T. Brown, Fifth Artillery; E. S. Benton, Third Artillery; J. K. Cree, Third Artillery; J. E. McMahon, Fourth Artillery; E. Hinds, Second Artillery; G. W. Gatchell, Fifth Artillery; J. L. Hayden, First Artillery; P. C. March, Fifth Artillery; W. E. Ellis, Fourth Artillery. Second Lieuts. W. J. Snow, First Artillery; LeRoy S. Lyon, Second Artillery; T. N. Horn, Second Artillery; F. E. Harris, First Artillery; K. Morton, Third Artillery; J. A. Shipton, First Artillery; G. H. McManus, Third Artillery; E. J. Timberlake, jr., Second Artillery; W. P. Pence, Fifth Artillery; C. C. Williams, Fourth Artillery; and J. Wheeler, jr., Fourth Artillery. Of the foregoing, Lieutenants Pence and Wheeler have since been relieved from further duty at the Artillery School, and ordered to report to the Superintendent of the United States Military Academy.

In addition to the regular class, Lieuts. Andrew Hero, jr., Fourth Artillery; Arthur W. Chase, Second Artillery, and William Chamberlaine, First Artillery, have been pursuing a special course of studies during the past year.

The purpose of the Artillery School is to provide a comprehensive course of instruction and practical training for artillery officers which shall be supplementary to that which they have already had. The course is divided into eight departments, to wit: Artillery, ballistics, engineering, steam and mechanism, electricity and mines, chemistry and explosives, military science and military practical exercises. To each department one instructor is assigned, and, except in the last named, instruction is given in each department every alternate year—two years being required to complete the entire course. Besides small technical libraries for the use of teachers and others in each department, the school is provided with a well-selected military library of about 12,000 volumes. It also has well equipped laboratories, affording ample facilities not only for thorough theoretical and practical training, but for the specialized work of special students, and for individual investigations.

Instruction is given by lectures, recitations and practical exercises in the field and in the laboratories. Text-books are used of which the instructors in some cases are the authors; in other cases the instruction given differs so much from the available text-books that these are largely supplemented by notes and pamphlets prepared by instructors. Written examinations are held at the end of each course, and the grading of student officers according to merit in each department is based entirely upon the result of these examinations.

The period covered by this report includes courses of instruction in engineering, artillery, ballistics, and photography.

ENGINEERING.

On the subject of military engineering, Capt. J. M. K. Davis, First Artillery, instructor, occupied the time from September 10 to November 19, and included military topography, field works, military bridges and roads, reconnaissance, and harbor defense.

ARTILLERY.

Instruction in the course of artillery, Capt. J. P. Story, Fourth Artillery, instructor, was given from November 19 to March 26, and embraced metallurgy of steel and iron, elastic strength of guns, problems in shrinkage, gunnery, gun making, gun carriages, armor and its attack by artillery.

During the progress of this course the opportunity was afforded the class to visit and examine the battle ship *Indiana*, then in Hampton Roads. Through the courtesy of its commander, Capt. H. C. Taylor, United States Navy, all parts of the ship were carefully examined and its principal features explained to each officer of the class by an officer of the ship, making the visit one of great interest and instruction to all.

BALLISTICS.

Exterior and interior ballistics, Capt. (now Major) James M. Ingalls, First Artillery, instructor, was under instruction from April 1 to June 30. The interest shown by the entire class in this rather difficult subject is reported by the instructor to have been most gratifying, and the ability displayed in the discussion and solution of ballistic problems was conspicuous. Instruction in this course was well abreast of the advances made in this eminently progressive science.

PHOTOGRAPHY.

The subject of photography has heretofore held only a tentative place in the curriculum of the school. Its increasing importance for military purposes as well as for scientific investigations, requires that it be given a more prominent place, and this question is now under consideration.

First Lieut. J. K. Cree, Third Artillery, a member of the student class and an expert photographer, had charge of this branch of instruction for the present class. Much credit is due to him for his voluntary and efficient services in this course. The afternoons in January and February were given to the subject. On account of the limited facilities afforded by the photographic studio, the class attended in groups of four at a time. Instruction embraced all the ordinary operations of photography, including the use of bromide and platinum paper, enlargement and reduction, and other processes of special application in reconnaissance and to other military purposes

Steam and mechanism, electricity and mines, and chemistry and explosives belong to the second year of the course. While no instruction of the regular class has been given in these courses during the past year, special students have been constantly under instruction in the two latter departments, and the laboratories have been constantly available for special work and individual investigations. Experimental work authorized by the Board of Ordnance and Fortification has been actively prosecuted by Lieutenants Squier, Allen, and Ruckman in the electrical laboratory, and in the department of explosives Lieutenant Walke has prepared a second edition of his lectures on explosives. The first edition of this work has been used as a text-book in this school since 1891. In the new edition the subject-matter has been enlarged, new matter introduced, and the work generally brought up to date, greatly enhancing its value both as a text-book and a book of reference. In addition to the foregoing, the laboratories of these departments have been much improved during the year by the addition of new machines and apparatus.

The shops connected with the department of steam and mechanism, and which are under the direction of Lieutenant Homer, instructor in that department, besides being valuable adjuncts to theoretical instruction, manufacture much of the machinery and apparatus required by other departments, thus making it possible to amplify the equipment of the school, beyond that obtainable from the limited appropriations available.

SPECIAL STUDENTS.

No definite course of study has been prescribed for special students, but each is allowed to select his subjects, and with the advice and assistance of the instructor to whose department they pertain, a course of studies is arranged in each case, subject to the approval of the staff. Excellent advantages are afforded such students, and those pursuing these courses during the past year have achieved gratifying success.

Prompted by a desire to acquire such knowledge of the German language as will make the ample military literature of that language available to them, a volunteer class was formed with Lieut. W. P. Duvall, Fifth Artillery, instructor, for the study of it. The hours of study and recitation were so arranged as not to interfere with other study or military duty. The class started with seventeen members, but four soon found it necessary to relinquish the undertaking on account of other duties. The attendance of the remaining members was con-

stant, and their interest and progress marked until July 30, when, after a session of nine weeks, instruction was suspended until September, at which time, the instructor reports, it is the wish of all to resume the study. The interest shown and the progress made suggest the wisdom of considering whether provision should not be made for an optional course in that study.

ENLISTED MEN'S DIVISION.

The enlisted division, First Lieut. C. D. Parkhurst, Fourth Artillery, instructor, has had its share in the general growth and development of the school, and has maintained its efficiency as a means of instruction for the noncommissioned officers and private soldiers of the post. It is believed, also, that the education offered tends to attract into the service a class of bright, intelligent recruits whose opportunities in civil life are far below their ambitions. With the addition of such men the general grade of intelligence is raised, and no difficulty is found, even under the steadily increasing demands for technical knowledge made upon the enlisted man by the modern material, in fitting them for the intelligent performance of their duties as noncommissioned officers and gunners.

During the last session of 130 school days the average daily attendance was 53. Of the 57 members of the school in attendance at the close, 13 were proficient on the entire two years' course and were given diplomas; 15 were proficient on the first year's course, and 29 will be permitted to take the first-class course again. It is worthy of note that 7 of the 13 to whom diplomas were given are privates.

LIBRARY.

The Artillery School library numbers about 12,000 volumes, mostly standard military and scientific works and other books of reference; also many pamphlets and scientific and military periodicals. There have been added during the year 303 volumes. The card indexing which has been successfully prosecuted for the past few years by the librarian, Captain Caziarc, becomes more valuable as the number of references increases. The frame structure in which the library is now contained affords inadequate room and insufficient protection for so valuable a collection of books. Its shelves have become year by year more crowded, until now their overflowing condition and cramped space make the books difficult of access and their use inconvenient. A new and more commodious fireproof or nearly fireproof building in a safer locality is an urgent necessity.

BINDERY AND PRINTING PRESS.

These indispensable auxiliaries to the efficiency of the school are under the mangement of the adjutant, First Lieut. Charles L. Phillips, Fourth Artillery. The kind and character of the work done is about the same as in former years, and its execution has been most satisfactory.

PRACTICAL ARTILLERY EXERCISES.

Practical artillery exercises included the service and mechanical maneuvers of the Gatling and Gardner machine guns, the Hotchkiss revolving cannon, the 3.2-inch field gun and 3.6-inch field mortar, and the seacoast guns; also the practical work of transporting from the

railway station and mounting on their emplacements three 10-inch B. L. R. and disappearing carriages, sixteeen 12-inch mortar carriages, and dismounting and shipping one 12-inch mortar and carriage. The guns and carriages were moved and mounted under the direction of Lieutenant Duvall, the mortar carriages under the direction of Lieutenant Ruckman.

Moving and hauling this modern ordnance was a new experience, and with the meager facilities at first available, called for the solution of original problems and new methods of execution which were productive of a maximum of instruction and benefit to the command. The work was speedily and successfully accomplished—how successfully was shown by the perfect working of the guns and carriages throughout the season's target practice by fifteen batteries.

The enlisted men not only showed interest but great intelligence in this work, and there are among them several noncommissioned officers and some privates who it is believed could be intrusted if necessary with the entire supervision of such work.

Target firing was had with the 15-inch S. B., the 8-inch M. L. R., the 8-inch B. L. R., and the 10-inch B. L. R., all of which except that with the latter gun was very satisfactory. The unsatisfactory results with the 10-inch B. L. R. were principally, if not wholly, due to the poor quality or condition of the powder used. Including the troops of the Fourth Artillery from Washington Barracks and Fort McHenry, fifteen batteries practiced with this gun, each battery firing three rounds, the three rounds being divided between two ranges, with different powder charges for each range. With so small an allowance thus distributed, no knowledge of the capabilities of the gun could be expected. There seems to be no reason for practicing with any but service charges. If the three rounds allowed a battery had all been fired at one range with service charges, and the firing of one battery had been followed by that of other batteries at the same range and under the same conditions until a group had been obtained from which reliable deductions could be made, much valuable information would have been the result. As it was, beyond familiarity with the working of the gun and carriage, no useful instruction was gained by the practice with this gun.

The record of the firing was made by means of the horizontal base heretofore in use; but a Lewis depression range finder and a Rafferty relocator having recently been installed at this post, observations and plottings were also made by means of these instruments, not only to familiarize officers and men with the use of them, but in order to compare the results thus obtained with those obtained with the horizontal base. When these results shall have been tabulated, they will afford the means of determining the relative merits of the two systems.

The installation of modern breech-loading artillery at this post should mark an important epoch in the artillery instruction of the school. When supplied with the other auxiliary means necessary for the complete service of a modern seacoast fortress, drills and other exercises that would follow would turn the attention of officers and men to the new artillery problems that await solution.

RECOMMENDATIONS.

As at present organized the curriculum of the school is divided into eight departments or courses of study, each department having one instructor, who instructs in his course once every two years. In the opinion of the staff, better results would be obtained by consolidating

these courses into departments, as follows: (1) Artillery and ballistics; (2) military engineering and the art of war; (3) steam and mechanism and electricity and mines; (4) chemistry and explosives and photography; practical military instruction to be given by the commanders of batteries to which student officers belong or are attached. This reduces the number of departments and consequently the number of instructors from eight to four, brings kindred subjects under one instructor, and will enable him to instruct in one of the courses every year. As each instructor would thus be occupied from but three to five months each year, he would have ample time for necessary study and research.

Two members of the student class, Lieutenants Pence and Wheeler, after having completed the first year's course of study, were relieved from duty at the Artillery School and ordered to duty at the Military Academy. I believe it to be detrimental to the best interest of the school and service and to the student officers themselves, to detach them for duty elsewhere, except in case of emergency.

Very respectfully,

ROYAL T. FRANK,
Colonel, First Artillery, Commanding.

The ADJUTANT-GENERAL UNITED STATES ARMY,
Washington, D. C.

REPORT OF THE ADJUTANT-GENERAL.

ANNUAL REPORT

OF THE

ADJUTANT-GENERAL TO THE SECRETARY OF WAR.

WAR DEPARTMENT,
ADJUTANT-GENERAL'S OFFICE,
Washington, October 19, 1897.

Hon. RUSSELL A. ALGER,
Secretary of War.

SIR: I have the honor to submit my annual report for the year ended September 1, 1897.

ADJUTANT-GENERAL'S DEPARTMENT.

By the retirement, on account of age, of Colonel Vincent, November 15, 1896, the death of Major Wilson, January 12, 1897, the retirement Colonel Greene, January 25, 1897, and of my honored predecessor, General Ruggles, September 11, 1897, my own appointment to be Adjutant-General on the latter date and the promotions consequent thereon, four vacancies in the junior grade of the Department were made and filled by the appointment of Major Wagner, November 17, 1896; Major Carter, January 29, 1897; Major Barry, January 29, 1897, and Major Heistand, September 11, 1897.

THE MILITARY INFORMATION DIVISION.

Col. Thomas M. Vincent, Assistant Adjutant-General, in charge of the division, having been retired November 15, 1896, and no officer of the Department being immediately available, the duties of the position devolved upon the senior officer of the line present, First Lieut. J. R. Williams, Third Artillery, who continued to perform them until April 7, 1897, with a high degree of capacity and usefulness. Maj. Arthur L. Wagner, Assistant Adjutant General, whose previous studies had specially fitted him for this work, assumed charge of the division, following Lieutenant Williams. His untiring devotion to its work has already added much to its value. Two officers—officers of the line—have been assigned to duty in the division, two have been relieved, and several others have been on temporary duty from dates varying from April to June, 1897.

Numerous changes have taken place among the military attachés during the past year. Switzerland and Japan have been added to the countries where our embassies or legations have a military attaché. The services of this class of officers is of great value to our military service, enabling us to profit by the experience of others, covering, as they do, information of new developments in military science, new inventions

in weapons of war, new designs in equipment, etc. The usefulness and importance of the work of this division is too well known to need further comment now, but its progress and helpfulness are much hindered by its limited accommodation of rooms—four only. The military-information division is an especial field for the work of our junior officers of the line who have shown their capacity in the service, and they should be given better working accommodations and more of them should be employed on this duty. Better accommodations should also be provided for the indexing, classification, and arrangement of its original papers, books, reports, etc., to make them available for the constant use to which they are put. The usefulness of this division is much impaired for lack of rooms.

The work of collecting military information from abroad has been steadily pursued and is now as much systematized as the limited number of officers on duty in the division will permit.

Pamphlet No. 12, published early this year, contains a report on the Swedish army and other papers selected for publication. This was followed in April by No. 13, "The organized militia of the United States in 1896," and later No. 14 was prepared under the title, "The military systems of Greece and Turkey, including a description of the Greco-Turkish frontiers." Several other publications are now ready for the press. The demand for the publications of the division far exceeds the authorized edition of 1,000 copies.

A large number of foreign publications, etc., have been received and catalogued in the military-progress section, and War Department publications have been sent to our military attachés abroad for exchange.

An increase in the appropriation for the expense of this division, now $3,640, to $6,000, to enable it to obtain by purchase more material from abroad, is recommended, as we are, with the present means, unable to obtain much that would be of advantage.

THE RECRUITING SERVICE.

During the past year the recruiting service has been conducted with unusually good results under the system established three years ago, of sending recruits enlisted at the various stations to regiments and posts with the least practicable delay. Not only have assignments been regularly made from recruiting stations and rendezvouses every ten days, but a very large proportion of the men enlisted at city stations during the year have been sent at once from the place of enlistment to the posts where they were to serve, without passing through a rendezvous.

During the fiscal year ending June 30, 1897, 4,762 recruits were forwarded to regiments, 3,879 directly from recruiting stations and 883 from rendezvous. All of these were sent to their stations either singly or in very small detachments under charge of some member thereof, avoiding expense for guards or escorts. From these 4,762 men five desertions only occurred en route. Three thousand five hundred and eighty-one men were enlisted at the posts where they were to serve, so that in their cases no expense for transportation was incurred.

The largest number of recruits at the four rendezvous at any one time during the fiscal year was 108, the smallest number was 19, and the average number was 45, or 11 to each rendezvous.

The efforts to increase the number of enlistments at military posts in order to effect a saving in transportation and in the number and

expense of city stations have met with marked success, as will appear from the following statement:

Enlistments during fiscal year 1897.

At city stations	4,060
At military posts	4,225
Percentage of post enlistments to whole number	51

This is an increase of 6 per cent over the preceding year in the relative number of post enlistments.

Recruiting for the line of the Army is carried on without intermission at every garrisoned post, subpost, and camp at which there is a commissioned officer, and also at city stations, limited in number according to the necessities of the service. So great has been the number of men offering that recruiting at all stations has been restricted throughout the past year to enlistment of exceptionally desirable men without prior service and to former soldiers with good discharges. In addition, it has been necessary at times to confine recruiting at city stations to enlistments of former soldiers.

The number of vacancies in the Army July 31, 1897 (the latest date for which full returns have been received), was 350. Of these, 333 were in the line of the Army and 17 in the staff departments. The average number of vacancies during the year ending July 31, 1897, was 355, the greatest number was 553, and the smallest number was 203. When the Army was least in strength the vacancies averaged only between one and two to each of the 364 organized companies, and the general average for the year has been less than one to the company.

In October, 1896, there were in operation 23 general recruiting stations, with 23 officers in charge. Seven of these stations have been closed during the past year, viz: Lynchburg, Va., November 10, 1896; Buffalo, N. Y., Detroit, Mich., and San Francisco, Cal., May 31, 1897; Baltimore, Md., June 30, 1897; Harrisburg, Pa., August 6, 1897, and St. Paul, Minn., September 30, 1897. The general recruiting station at Evansville, Ind., was transferred in December, 1896, to the light artillery recruiting service, and has since been maintained as a special recruiting station. The remaining 15 general recruiting stations are located as follows:

One each in Boston, Mass., New York City and Albany, N. Y., Philadelphia and Pittsburg, Pa., Cincinnati and Cleveland, Ohio, Indianapolis, Ind., Chicago, Ill., Milwaukee, Wis., St. Louis, Mo., Louisville, Ky., Nashville, Tenn., Richmond, Va., and Seattle, Wash. The officer for the station at Seattle is detailed by the commanding general, Department of the Columbia, from a regiment serving in his command.

Officers of the general recruiting detail at city stations, as a part of their duties, make enlistments for their own regiments to fill actual vacancies reported by their regimental commanders.

Special recruiting is carried on for two regiments and for the light artillery by officers at the following-named stations: Portland, Oreg., Dallas, Tex., and Evansville, Ind. Enlistments for the general service are also made at these stations. Three special recruiting stations have been closed during the year, viz, those at Jersey City, N. J., Providence, R. I., and Syracuse, N. Y.

Since October 1, 1893, there has been a total reduction of 33 in the number of city recruiting stations, viz, 21 general and 12 special. With a return of general prosperity and larger opportunities for employment it will no doubt be necessary to increase the number of recruiting stations and officers.

General results.

The total number of enlistments and reenlistments in the Army during the fiscal year ended June 30, 1897, for the legal limit of 25,000 men was 8,285, classified as follows:

For the general recruiting service	7,638
For the special recruiting service	428
	8,066
For staff departments	219
Total	8,285

Of the 8,285 accepted applicants 6,239 were native born and 2,046 of foreign birth. Seven thousand six hundred and ninety-seven were white, 569 colored, and 19 Indians. The enlistments numbered 5,280 and the reenlistments 3,005.

Excluding reenlistments, the percentage of native born among the accepted applicants for original enlistment was 83⅓, and the balance were naturalized citizens.

Reports show that the recruiting officers making the 8,066 enlistments embraced in the first two items of the foregoing list rejected 41,058 applicants, a little over 83½ per cent of the number seeking enlistment as lacking in legal, moral, physical, or mental qualifications; 2,791 of these were rejected as aliens, and 2,333 for illiteracy.

The aim has been to maintain, from month to month, a rate of enlistment commensurate with the losses, and at the same time to exercise every care to keep undesirable men from entering the Army.

The acceptance of less than 17 per cent of those offering indicates that, as a rule, recruiting officers have selected only the very best applicants for enlistments, and the ranks of the Army are filled by a superior class of men.

The average age of those enlisted and reenlisted was about 27½ years. Excluding reenlistments, the average ages of those accepted for original enlistments were as follows: White, 24.13 years; colored, 25.24 years, and Indians, 37.17 years.

Indian enlistments.

No enlistments nor reenlistments for the Indian contingent were made during the fiscal year ended June 30, 1897, but 19 Indians were enlisted or reenlisted for duty as scouts.

The discharge, May 31, 1897, of the 53 Indians comprising Troop L, Seventh Cavalry, ended the scheme—formulated by General Orders, No. 28, from general headquarters, dated March 9, 1891—of recruiting 8 troops of cavalry and 19 companies of infantry to form an Indian contingent as part of the regular establishment. Notwithstanding strenuous and intelligent efforts on the part of the officers selected for the recruiting, command, and management of the several Indian troops and companies, the Indian contingent has never reached a degree of substantial success as useful soldiers. The total number of Indian soldiers enlisted and reenlisted since March, 1891, was 1,071.

MILITARY COLLEGES.

The data in the statement herewith, tabulated from the reports of officers on duty as professors of military science and tactics at the several universities and colleges during the past scholastic year, give results that do not differ materially from those reported for the preceding year. Of the 31,828 students present, 29,147 were youths over 15

years of age. The number reported capable of military duty was 26,227; the number required to be enrolled as military students, 15,516; the number uniformed, 12,221, and the total number that received military instruction was 15,608. The attendance at artillery and infantry drills was, respectively, 1,214 and 11,138.

Accumulated experience points out the necessity of amending the law under which details are made. The present requirement that, to receive the benefit of a detail, the institution seeking it shall have capacity to instruct not less than 150 pupils at the same time should be replaced by the condition that not less than that number of students are actually present. It will be seen from the table herewith that at 23 institutions the number of pupils present ranged from 50 to 100, while at 7 of them the number was less than 50.

As evidencing the value of military training as an important factor of discipline, it is noted that, in most instances, the degree of discipline maintained at an institution is in direct ratio with the amount of interest in military instruction manifested by its faculty.

The reports of the military professors disclose a great lack of facilities at many of the colleges for both indoor and outdoor exercises. Indoor facilities do not exist at 25 colleges, while at 30 others they are characterized as poor or inadequate. Of outdoor facilities there are none at 6 institutions, and at 10 others they are poor. When it is considered that the scholastic year embraces the winter months the deplorable lack of proper facilities seriously interferes with the full development of the military course of instruction and would indicate but slight appreciation of its value. In one instance a hall about 1 mile from the college is hired for indoor exercises, while for outdoor drill the ground provided is equally distant.

The good work of the officers, Lieutenants Penn and Clement, who, with the consent of the War Department, successively commanded the battalion of the "Omaha High School Cadets," is steadily increasing. The battalion is now organized with four uniformed companies, a drum corps, and one ununiformed company, with the regulation number of officers and noncommissioned officers. The average attendance at all drills was 248. The uniforms, costing only, complete, $12.65, proved very satisfactory, as shown by the fact that over 200 were voluntarily purchased. The system of instruction embraced simply setting up exercises, squad and company drills, with occasional lectures and parades. As but two hours per week were devoted to drills, the military exercises did not interfere with the course of studies, proving, in fact, a healthy and highly beneficial variation.

High schools embrace an element of our population that makes our greatest military strength that is not extensively reached through the class of educational institutions to which officers are assigned as professors of military science and tactics. With a view, however, to the dissemination of some of the elements of military instruction to our youths at the most receptive condition of mind, high schools are logical objectives, but it appears that a capable sergeant could in general perform these duties without calling upon officers for them.

THE MILITARY ACADEMY.

The number of cadets on September 1, 1897, was 338, including one foreigner reciving instruction by special authority of Congress, and is the largest number of cadets that has ever been present at the Academy at one time. During the past year 68 cadets were graduated, 48 were discharged for deficiency in studies, 1 for disability, and 6 resigned.

The total number of admissions at the examinations held in March, June, and August last was 129, leaving 34 vacancies.

It is recommended, as a matter of equity, that the adjutant of the Military Academy, whose duties are both important and exacting, be given the pay of captain, mounted. It is also hoped that the bill, now pending, giving the master of the sword the pay of a first lieutenant of infantry will become a law at the approaching session of Congress. It has already been favorably recommended by both military committees.

The improvement of the library building has become a pressing need, as the library has absolutely outgrown its present capacity.

The discipline and drill of the corps of cadets has been maintained at its usual high standard.

It is gratifying to state that the health of the command during the past year was decidedly better than during the preceding year.

CHAPLAINS.

The laws governing the appointment of chaplains in the Army simply require that a chaplain shall have been a regularly ordained minister of some religious denomination and shall have presented testimonials of his good standing as such, while his new duties are prescribed in general terms.

Premising that the conditions which surround the Army chaplain differ largely from those which, in civil life, he has been accustomed to in regular parish work, it becomes apparent that the measure of his efficiency in the new field of duty will depend on three important factors—sound physical health, suitable age, and adaptability and preparation. On the second and third requirements depend the degree of ease and facility with which he will learn the duties of his position, and his capacity to become thoroughly imbued with the spirit of military organizations, their conditions and needs, and not only to recognize but actively meet the demands of his new sphere of action. These latter qualifications, though of the utmost importance with a view to the best results, are, necessarily, difficult of acquirement by a man who, having reached the meridian of life, can not, therefore, readily change the mode of thought and action and settled ways of life which, in a large measure, have become to him a second nature.

The average age of the chaplains now in the service, as shown by an examination of the roster, was, at date of appointment, nearly 44 years, the oldest (now retired) being 59 years of age when appointed, while the youngest was 35 years old. It appears also that the ages of over one-half of the whole number ranged between 40 and 55 years.

Deeply impressed by the above consideration and facts, I am impelled to recommend that, by legislative enactment, the appointment of chaplains be restricted to candidates not over 30 years of age, or at most 35, and that the latter be required to pass an examination before a board constituted to determine their physical soundness and their qualifications and adaptability. It is suggested that such boards consist of three chaplains of the same denomination as the applicant and two medical officers; the duty of the latter to be confined to the physical examination. As it may not always be practicable to detail the members of the board from the chaplains of the Army, eminent clergymen of the same denomination, from those attached to the universities, to be employed, when required, to act as members. The duties of the board would be to determine the entire fitness of the candidate by an examination, the details of which, as in the case of other officers, would be determined by the War Department.

INCREASE OF THE ARTILLERY AND INFANTRY.

A bill to reorganize the line of the Army, etc., increasing the artillery by two regiments and each infantry regiment by two companies, was introduced in Congress during the first session of the Fifty-fourth Congress (S. 2202 and H. R. 5835) and favorably reported by the Senate Committee on Military Affairs, its title being changed to "A bill to provide a modern organization for the line of the Army." I have been informed that it was also favorably considered by the Military Committee of the House of Representatives. It is still pending before Congress and has heretofore been strongly recommended by the Commanding General of the Army and by the Secretary of War. It is an absolutely necessary provision for the preservation, care, and use of our seacoast armament, and, as an indispensable preparation to meet emergencies of the country's service as they arise, as they are certain to do, I recommend that the passage of this bill be urged upon Congress.

DETACHED SERVICE OF OFFICERS.

The detached service of officers for duties at schools and colleges, with the militia, and other duty separating them from service with the Army makes a heavy draft on the effective strength of its officers, being in addition to details for the service necessary for the Army, details at the Military Academy, the service schools, recruiting service, etc., and it is believed has reached a maximum which can not be exceeded without very serious damage to the service. The artillery especially suffers much from the absence of so many of its officers. The first lieutenants of artillery, whose long service in that grade has given them a natural feeling of discouragement at their prospects, frequently seek such details at the colleges to assist in the education of their children, which their small pay and advancing years make a heavy tax on this highly meritorious class of officers. These officers are much sought after for duty at the Military Academy, etc. The result is that the artillery is much embarrassed by the absence of its officers, who are specially needed at this time when the new armament is being supplied and new defensive batteries are being occupied. For the foregoing reasons I recommend that the number of officers detailed to schools and colleges be not increased, as is frequently proposed.

LAND FOR MINOR TACTICAL EXERCISES AND RIFLE RANGES.

Grounds for minor tactical exercises and rifle ranges are needed for all permanent cavalry and infantry posts. A number have heretofore been provided, but Columbus Barracks, Fort Sam Houston, Washington Barracks, and Fort Myer especially need such provision for instruction. It is recommended that they be provided. Also, that at least one tract of ample size be provided in the West, say near Columbus Barracks, Ohio, where the militia of several States can join with the Army for instruction in field duties and exercises, and that such provision be made by law for the command and service of such a camp and of calling the militia to it. The advantage of this to the country is too evident to need more than mention to be appreciated.

ENLISTED MEN.

The character and efficiency of the enlisted men of the Army have never been higher than at the present time. The short term of service and liberal discharge, by purchase or order, of men who find themselves,

or are found, unsuited to the service, has eliminated from the Army most of those who are a disadvantageous element. Rifle practice, physical training, exercises in minor tactics, athletic sports, and careful instruction in appropriate military subjects, with a judicious and humane discipline, in which the Commanding General of the Army has had the hearty cooperation of commanding generals and of the officers under them, coupled with a careful and judicious recruiting service conducted under my predecessor, Brigadier-General Ruggles, have placed in the Army at this time enlisted men of good character, intelligence, fine physical development, and highly efficient. It is a pleasure to record that where they have been brought in immediate contact with civilians at the various militia camps of instruction, expositions, on practice marches, etc., the officials and the press speak warmly in their praise.

PAY OF NONCOMMISSIONED OFFICERS.

Too much stress can hardly be laid on the importance of the recognition of the duties and responsibilities of the noncommissioned officers of the line, and the demands made on their intelligence and capacity by the advance in the equipment and training of the Army, and the consequent necessity of remedying the inadequacy of the present pay of that class which is a factor of no small importance to the success of military operations and training. The noncommissioned officers of the artillery, especially, must meet requirements for their duties with modern, high-power and rapid-fire guns, which call for a high degree of acquirement and training.

A bill to regulate the pay of noncommissioned officers has passed the Senate and is now pending in the House. It is earnestly recommended that the attention of Congress be called to the subject, with a view to the early passage of a comprehensive measure covering this subject, which is deemed vital to the best interests of the Army, that it may retain the trained men capable of filling the requirements of the service.

NEWSPAPER PUBLICATIONS.

By General Orders, No. 52, dated War Department, Adjutant-General's Office, August 24, 1897, no person, other than officers of the Army and Navy, or persons in the service of the United States employed in direct connection with the construction or care of defensive works, is allowed to visit any portion of the lake or coast defenses of the United States, without the written authority of the commanding officer in charge, to be given only for proper military reasons. Special permits, granted by the Secretary of War, are limited to United States Senators, Members of Congress, and the governor (or his adjutant-general) of the State in which the works are located. The order further forbids the making of written or pictorial descriptions of these works for publication, or giving any information respecting them, without the authority of the Secretary of War.

The object of the above restriction needs no explanation, and its purpose is fully reached within the sphere of jurisdiction of the military authorities. There remains, however, a serious danger unprovided for, namely, the publication of articles on this subject, or their preparation, or possession, or use in any way, except for official use. As a knowledge of the defensive works and their armament, by the enemy, practically weakens them, it is therefore recommended that this subject be brought to the attention of Congress with a view to a legislative prohibition and severe penalties for such publications or papers.

CLERICAL DUTY.

The present organization of the force of civilian clerks for duty with the commanding general of the Army and the commanding generals of the several departments, is as follows: Ten clerks of class $1,200, eighteen clerks of class $1,100, seventy-two clerks of class $1,000.

The duties performed by these clerks assimilate to those devolved on the clerical force of the War Department, while their compensation is graded on a much lower scale. This is especially true with reference to the clerks selected for the position of chief clerk at general and department headquarters. These clerks are selected for capacity and acquirements after service in the Army, and are charged with important duties demanding an extended acquaintance with correct methods of military administration, the Army Regulations, military laws, etc. To remedy, in part, the inequality of compensation not at all warranted by existing conditions of duties performed, I have the honor to recommend that the grade of chief clerk at the Headquarters of the Army be of Class IV, and at the several military department headquarters of Class III. This force would then be graded as follows: One clerk of class $1,800, eight clerks of class $1,600, ten clerks of class $1,200, eighteen clerks of class $1,100, sixty-three clerks of class $1,000.

The partial rerating involves an increase of but $5,600 in the appropriation for the force, and will be an act of simple justice to the highly efficient and deserving men benefited.

HALL OF RECORDS.

The crowded condition of the rooms of this office with employees and records makes a pressing demand for at least ten more rooms of average size to meet the needs of its service and to give room for each one to work without impeding others or risking accidents from the use of the high cases for files and books. A "hall of records," where those records of the War Department least used can be arranged to serve their purposes, is a necessity which I can not too strongly urge upon your attention, and I recommend its construction at an early date.

The multiplication of patriotic societies composed of those who served honorably in the recent wars, and the descendants of those who so served in those more remote, has created an unusual demand for information from the older records, which a due regard for the encouragement of patriotism requires should be met in a liberal spirit, and that the older records should be made and kept accessible for this purpose.

A new building for a hall of records, properly equipped, would enable this and other work from those records to be done with speed and economy, and afford a very much-needed relief to the War Department proper to give it space for the speedy and convenient dispatch of current administrative business. I recommend that Congress be urgently requested to authorize this additional building.

GOVERNMENT HOSPITAL FOR THE INSANE.

The following is a list of persons committed to the Government Hospital for the Insane, under the orders of the Secretary of War, from September 1, 1896, to September 1, 1897:

Officers of the United States Army	2
Officers of the United States Army (retired)	1
Enlisted men of the United States Army	21
Enlisted men of the United States Army (retired)	1
Total	25

During the past year two officers and eleven enlisted men, including one retired enlisted man, have been discharged from the institution; during the same period one officer (retired) and eleven enlisted men have died.

THE ADJUTANT-GENERAL'S OFFICE.

The legal organization of this office remains the same as at the date of the last report, and its entire clerical force has been actively employed on the current work pertaining to the Army.

The calls for reports to the Pension Office, the Auditors for the War and Navy Departments, the General Land Office, and the several bureaus of the War Department, on pension and kindred claims, up to September 1, 1897, were all responded to.

The current business of the office, although conducted under the serious disadvantage of crowded quarters and increasing inadequacy of space for the records and files, has been satisfactorily dispatched. The commencement of the work of examining and indexing the records relating to the officers and men of the Regular Army in the war of 1812, recently transferred to this office from the offices of the Auditor for the Interior Department and the Auditor for the War Department (the transfer is not yet completed), has now been undertaken with a temporary detail of five clerks transferred to this office.

While the duties performed by the clerical force of the Adjutant-General's Office are second to none in importance, the organization of that force with regard to grades above that of Class I is much below that in other bureaus, and operates to deprive efficient and experienced clerks in the lower classes of the just and reasonable expectation of advancement due to efficient, intelligent, faithful, and prolonged service. I have, therefore, the honor to recommend that the number of clerks of Classes III, II, and I be fixed as follows: Twenty clerks of Class III, twenty-five clerks of Class II, and forty clerks of Class I.

The above will increase the number of clerks in Class III from 14 to 20; in Class II from 13 to 25; while the number of those in Class I will be reduced from 58 to 40. While the total force remains unchanged in numbers, and the appropriation therefor is increased by only $4,800, the recommendation is in the line not only of justice but also of increased efficiency. The proposed strength of Classes III and II will still be in lower ratio to total force than exists in several of the bureaus of the War Department.

I take pleasure, in closing this report, in recording my appreciation of the general intelligence, zeal, and efficiency of the clerks of this office.

Respectfully submitted.

SAM'L BRECK,
Adjutant-General.

Tabulated statement from reports of professors of military science and

Universities and colleges.	Number of pupils the institution can educate at one time.	Average number of pupils— Present.	Over 15 years of age.	Capable of military duty.	Required enrolled as military students.	That received military instruction.	Uniformed.	Military instruction (hours per week). Practical.	Theoretical.	Arms (United States property) at institution. Field pieces.	Cadet rifles.	Condition.
Alabama Agricultural and Mechanical College, Auburn.	500	270	270	254	242	242	238	3	2	2	210	Fair .....
University of Alabama, Tuscaloosa County.	250	120	120	120	74	74	74	3	1	None.	150	Fair .....
Arkansas Industrial University, Fayetteville.	1,000	245	245	245	245	270	270	3	5	None.	275	Excellent.
Ouachita Baptist College, Arkadelphia, Ark.	150	97	90	92	78	78	27	5	12½	None.	None.	.....
University of California, Berkeley.	1,000	717	717	648	575	575	504	1	2	2	525	Good.....
Mount Tamalpais Military Academy, San Rafael, Cal.	150	68	50	50	68	68	64	4	1	2	80	Good.....
State Agricultural College, Fort Collins, Colo.	250	148	148	160	159	159	138	(*a*)	....	2	150	Good.....
Yale University, New Haven, Conn.	(*b*)	2,400	2,400	2,400	184	120	.....	3	1	.....	80	Good.....
Delaware College, Newark, Del.	150	65	65	61	(*c*)	55	55	3	....	2	75	Good; fair.
Florida Agricultural College, Lake City, Fla.	300	90	80	94	(*d*)	87	86	4	1	2	110	Fair.....
East Florida Seminary, Gainesville, Fla. *e*	150	38	35	37	37	37	37	3	....	.....	99	47 badly worn.
North Georgia Agricultural College, Dahlonega.	300	55	50	50	50	50	50	5	3½	1	148	Good.....
Gordon Institute, Barnesville, Ga.	250	175	109	92	(*f*)	87	87	5	2	.....	100	Very good.
Middle Georgia Military and Agricultural College, Milledgeville.	500	250	45	76	76	76	76	4	2½	2	98	Good.....
University of Idaho, Moscow.	200	77	77	75	75	83	73	3	1	2	100	Good.....
University of Illinois, Champaign.	1,500	753	753	248	248	248	248	4	3	2	300	Good.....
Knox College, Galesburg, Ill.	500	272	272	267	88	119	119	3	....	2	90	Good.....
Northern Illinois Normal School, Dixon.	1,000	200	200	300	None.	37	37	5	1	2	100	Fair .....
Western Military Academy, Upper Alton, Ill.	150	64	50	50	62	62	64	4½	2	2	65	Good.....
Del'auw University, Greencastle, Ind.	1,000	313	311	300	106	94	84	6	2	2	150	Good.....
Vincennes University, Vincennes, Ind.	150	80	75	80	62	62	30	3	1	.....	60	Not stated
Purdue University, Lafayette, Ind.	700	600	600	550	173	182	182	7	1	2	174	Good.....
Culver Military Academy, Culver, Ind. *e*	160	86	75	86	86	86	70	16	5	2	90	Excellent.
Cornell College, Mount Vernon, Iowa.	500	196	195	185	196	175	100	3	4	2	250	Good.....
Iowa State University, Iowa City.	400	298	298	274	205	213	205	3	....	2	200	Good.....
Iowa Wesleyan University Mount Pleasant.	500	104	104	97	84	90	84	3	1½	1	100	Fair .....
Iowa State Normal School, Cedar Falls.	500	250	250	237	230	230	200	3	....	2	225	Good.....
State Agricultural College, Manhattan, Kans	400	255	255	244	230	241	230	5	2	2	225	Good.....
Baker University, Baldwin, Kans.	300	136	134	131	81	81	62	3	....	.....	107	Good.....
Agricultural and Mechanical College of Kentucky, Lexington.	500	169	164	159	169	210	184	5 in all.		2	150	Serviceable.

a Not stated. *b* Unknown. *c* All except seniors.

tactics, showing average attendance of students at universities and colleges.

Attendance at—		Facilities for drill.		Students.		Discipline of the institution.	Interest manifested by the faculty.
Artillery drills.	Infantry drills.	Outdoor.	Indoor.	Aptitude.	Interest.		
16	208	Good	None	Good	Fair	Fair	Fair.
.....	64	Fine	None	Good	Small	Fair	Very little.
.....	235	Fair	Fair	Excellent	Excellent	Excellent	Very marked.
.....	58	Ample	Inadequate	Fair	Good	Satisfactory	Satisfactory.
17	369	Good	None	Excellent	Fair	Civil	Desire to support the law.
63	63	Ample	Ample	Good	Good	Excellent	Very good.
18	142	Fair	Poor	Good	Satisfactory	Excellent	Satisfactory.
.....	83	None	Armory of 2d Regt. N.G. available.	Excellent	Considerable	Good	Great.
17	52	Athl. field, 5 acres.	Drill hall, 40 by 60.	Good	Good	Good	About as in other departments.
10	73	College campus; too small.	None	Very good	Very good	Fair	Good.
.....	30	Par'de gr'nd; too small.	None	Good	Fair	Very good	Great.
8	40	Good	Poor	Fair	Fair	Poor	Encouraging.
9	74	Space somewhat br'kn	Inadequate	Great	All that can be desired.	Excellent	All that can be desired.
21	69	Drill ground	Halls of college.	Good	Good	Good	Good.
18	71	Good	Poor	Good	Good	Good	Fair.
16	163	.....	Drill hall, 100 by 150.	Great	Great	Excellent	Very satisfactory.
25	89	Good	Poor	Good	Excellent	Mild but firm	Good.
.....	30	Fair	Poor	Very good	Very good	Poor but improving.	Good and improving.
19	55	Parade gr'nd	Gymnasium	Good	Fair	Deteriorated	Not so good as usual.
12	66	Good	Fair	Good	Generally good.	Fair	Good.
.....	53	Good	Good	Good	Good	Good	Good.
19	137	Good	Good	Good	Great and increasing.	Excellent	Great.
13	82	Ample	Ample	Excellent	Excellent	Very good	Excellent.
16	105	Excellent	None	Good	Good	Good	Good.
17	150	College campus, 4 acres	Armory rented.	Very good	Very satisfactory.	Excellent	Highly satisfactory.
9	83	Fair	Poor	Good	Good	Good	Good.
18	220	Good	Small drill hall.	Good	Good	Good	All that could be expected.
.....	201	Inadequate	Inadequate	Good	Good	Good	Increasing.
.....	65	Good	None	Fair	Poor	Fair	Good.
21	119	College campus.	None	Good	Fair	Good	Very good.

d All qualified unless excused. *e* Retired officers as military professors. *f* Voluntary.

Tabulated statement from reports of professors of military science and tactics,

Universities and colleges.	Number of pupils the institution can educate at one time.	Average number of pupils—						Military instruction (hours per week).		Arms (United States property) at institution.		
		Present.	Over 15 years of age.	Capable of military duty.	Required enrolled as military students.	That received military instruction.	Uniformed.	Practical.	Theoretical.	Field pieces.	Cadet rifles.	Condition.
Central University of Kentucky, Richmond.	500	301	250	240	171	169	113	3	2	2	200	Good.....
Georgetown College, Georgetown, Ky.	300	162	133	141	105	102	19	3	....	.....	150	Good.....
Louisiana State University and Agricultural and Mechanical College, Baton Rouge.	300	185	182	178	166	166	166	5	2	2	150	Good.....
The University of Maine, Orono.	250	230	230	225	213	213	213	3	1½	.....	220	Good.....
St. John's College, Annapolis, Md.	200	117	105	109	108	110	110	5	1	.....	128	Good.....
Maryland Agricultural College, College Park, Prince George County.	150	109	104	106	107	114	106	7½	2½	2	150	Good.....
Massachusetts Agricultural College, Amherst.	250	75	75	74	74	74	74	3	1	2	147	Very good.
Massachusetts Institute of Technology, Boston.	1,200	1,070	1,070	1,000	260	264	258	2	1	.....	260	Good.....
Howard University, Cambridge, Mass.	(*a*)	3,660	3,660	2,122	None.	94	None.	....	3	.....	68	New .....
Michigan Military Academy, Orchard Lake.	175	117	113	117	117	117	117	....	10	5	96	Rifles not good.
Michigan Agricultural College, Lansing.	500	190	190	175	175	155	150	3	....	2	150	Poor .....
University of Minnesota, Minneapolis.	2,500	666	666	452	460	317	316	2	1	2	300	Good.....
Bishop Seabury Mission, Faribault, Minn. *b*	200	161	151	161	161	161	161	5	1	2	175	Good.....
Agricultural and Mechanical College of the State of Mississippi, Oktibbeha County.	350	238	238	235	238	248	238	2	5	2	250	Serviceable.
University of the State of Missouri, Columbia.	1,500	487	487	449	(*c*)	126	126	3	....	2	150	Good.....
St. Louis University, St. Louis, Mo.	500	300	175	40	(*d*)	128	128	1½	½	.....	150	Excellent.
Wentworth Military Academy, Lexington, Mo.	150	84	62	84	86	86	86	5	....	.....	100	Good.....
University of Nebraska, Lincoln.	2,000	625	625	800	800	355	270	5	5	2	400	Good.....
Doane College, Crete, Nebr.	200	66	65	65	65	67	65	3	3	1	80	Good.....
State University of Nevada, Reno.	150	149	135	149	147	147	147	2½	....	2	99	Very good.
New Hampshire College of Agriculture and the Mechanic Arts, Durham.	200	75	75	75	50	50	50	4	1	.....	65	Good.....
Rutgers College, New Brunswick, N. J.	300	162	(*f*)	160	111	110	110	2	3	.....	150	Good.....
Seton Hall College, South Orange, N. J.	150	72	61	64	58	60	58	3	¾	2	125	Serviceable.
Cornell University, Ithaca, N. Y.	3,000	1,500	1,500	1,400	500	400	400	3	....	2	400	Good.....
St. John's College, Fordham, New York City, N. Y.	650	190	140	125	184	184	184	2	2	2	225	Excellent.
St. John's Military School, Manlius, N. Y.	150	79	66	77	79	79	79	4	2½	2	105	Good.....
De La Salle Institute, New York City, N. Y.	250	187	187	157	192	192	192	5 in all.		2	150	Excellent.

a Not stated.

b Retired officers as military professors.

showing average attendance of students at universities and colleges—Continued.

Attendance at—		Facilities for drill.		Students.		Discipline of the institution.	Interest manifested by the faculty.
Artillery drills.	Infantry drills.	Outdoor.	Indoor.	Aptitude.	Interest.		
15	63	Good	Very poor	Good	Good	Poor	Satisfactory.
-----	68	Ample	Inadequate	Good	Fair	Fair	Good.
-----	154	Good	None	Good	Good	Fair	Fair.
-----	166	Good	None	Good	Very good	Very good	Very good.
-----	102	Fair	None	Good	Active	Collegiate	Excellent.
21	97	Good	Good; no drill hall.	Very good	Very great	Good	Lively.
17	71	Excellent	Excellent	Good	Good	Good	Great.
-----	216	None	Good	Very good	Considerable.	Good for university.	Slight.
-----	-----	None	None	Excellent	In military instruction, excellent; in exercises, slight.	That of other universities.	Fair.
75	110	Good	Good	Excellent	Very great	Excellent	Comparatively little.
10	122	Excellent	Excellent	Excellent	Good	Fair	Very little except by the president.
13	253	Excellent	Excellent	Very good	All that can be desired.	Not military.	Very good.
19	158	Good	Good	Very apt	Great	Good	Fair.
31	49	Good	Very poor	Good	Good	Excellent	Good.
-----	71	Good	Good	Good	Good	Fair	Not very great.
-----	102	Inadequate	Inadequate	Very good	Satisfactory	Very good	Satisfactory.
8	71	Inadequate	Inadequate	Good	Very creditable.	Good	Very encouraging.
25	210	Campus, 600 by 225.	None	Good	Good	Good	Good.
-----	60	Ample	Inadequate	Good	Generally satisfactory.	Good	Very satisfactory.
16	100	None	Drill hall, 100 by 60.	Fair	Fair	Poor	None whatever, except by the president.
e 50	50	Good	Good	Good	Good	Civil	Good.
-----	106	Good	Good	Good	Great interest.	Good	Very good.
12	55	Ample	Inadequate	Good	Satisfactory	Good	Slight.
15	273	Fair	Fair	Good	Good	Good	Favorable.
14	157	Excellent	Good	Good	Good	Excellent	Very satisfactory.
13	76	Good	Good	Good	Good	Very good	Same as in any other branch.
-----	167	Poor	Poor	Good	Generally good.	Fairly good.	Earnest, but not entirely effectual.

c All appointed cadets. *d* Voluntary. *e* Saber only. *f* Not stated.

Tabulated statement from reports of professors of military science and tactics,

Universities and colleges.	Number of pupils the institution can educate at one time.	Average number of pupils—						Military instruction (hours per week).		Arms (United States property) at institution.		
		Present.	Over 15 years of age.	Capable of military duty.	Required enrolled as military students.	That received military instruction.	Uniformed.	Practical.	Theoretical.	Field pieces.	Cadet rifles.	Condition.
New York Military Academy, Cornwall-on-the-Hudson.	160	106	75	77	77	106	106	5	2	2	88	Fairly good
Clinton Liberal Institute, Fort Plain, N. Y.	150	46	42	45	42	43	43	5½	½	2	105	Very good.
College of St. Francis Xavier, New York City, N. Y.	800	645	365	365	240	240	240	3	....	.....	230	Good.....
Riverview Academy, Poughkeepsie, N. Y.	175	128	117	117	117	117	128	4	1	2	150	Not stated.
Bingham School, Asheville, N. C.	150	89	86	85	85	86	89	5	3½	2	150	Very good.
Davis School, Winston, N. C. *a*	(*b*)	54	49	55	57	47	47	3½	3½	.....	115	Good.....
North Carolina College of Agriculture and Mechanic Arts, Raleigh.	250	180	176	160	140	140	140	3	....	.....	150	Good.....
University of North Dakota, Grand Forks. *a*	400	70	70	67	53	53	52	4	2	.....	90	Good.....
North Dakota Agricultural College, Fargo.	175	43	43	43	33	33	33	3	1	.....	(*c*)	Very bad..
Ohio State University, Columbus.	1,500	710	710	500	385	226	385	5	....	.....	300	Fairly good
Ohio Normal University, Ada.	1,200	800	800	700	(*d*)	239	30%	5	2	2	200	Serviceable.
Ohio Wesleyan University, Delaware.	750	370	370	263	(*d*)	177	99	3	....	2	300	Fair.....
Wilberforce University, Wilberforce, Ohio.	175	98	98	105	105	105	60	4	2	2	100	Very good.
Ohio Military Institute, College Hill, Cincinnati. *e*	150	20	20	20	20	20	20	5	....	2	87	Not stated.
Denison University, Granville, Ohio.	500	200	190	190	(*d*)	93	93	2½	½	.....	120	Good.....
State Agricultural College, Corvallis, Oreg.	400	134	134	151	145	145	145	3½	....	.....	100	Good.....
The Pennsylvania State College, State College.	500	239	239	234	186	186	186	4	1½	2	150	Requiring armorer.
Allegheny College, Meadville, Pa.	400	197	197	190	71	73	62	4	2	2	146	Good.....
Pennsylvania Military College, Chester.	150	112	104	115	115	115	115	6	2½	2	145	Good.....
Grove City College, Grove City, Pa.	500	278	278	246	246	227	152	4	1	2	150	Very good.
Girard College, Philadelphia, Pa.	1,600	1,480	116	586	586	586	534	2½	4	2	500	Very good.
Franklin and Marshall College, Lancaster, Pa.	Over 150	168	168	163	65	87	45	2	....	.....	95	Very good.
Brown University, Providence, R. I.	1,100	700	700	650	144	173	173	2	1	2	260	Good.....
College of Agriculture and Mechanic Arts, Kingston, R. I.	150	67	67	65	65	65	65	3	2	3	80	Good.....
South Carolina Military Academy, Charleston.	200	119	119	119	119	119	119	7	10	2	150	Old .....
Clemson Agricultural College, Clemson College, S. C.	300	299	297	308	308	307	308	2	1	2	500	Good.....
Agricultural College of South Dakota, Brookings.	300	150	149	145	91	115	86	3	1	2	150	Good.....
University of South Dakota, Vermilion.	250	107	101	100	64	69	63	4	1	2	111	Quite good
University of Tennessee, Knoxville.	500	179	179	179	120	120	120	6	1	2	150	Good.....

a Since withdrawn. *b* Not stated. *c* 50 Springfield belonging to State.

showing average attendance of students at universities and colleges—Continued.

Attendance at—		Facilities for drill.		Students.		Discipline of the institution.	Interest manifested by the faculty.
Artillery drills.	Infantry drills.	Outdoor.	Indoor.	Aptitude.	Interest.		
17	77	Ample.....	Rather small	Good	Excellent...	Excellent...	Most gratifying.
17	39	Good	Very good..	Very good..	Very good..	Very good..	Generally good.
.....	109	None	Armory 9th N. Y. N. G.	Good	Good	Good	Good.
13	44	Good	Rather limited.	Good	Good	Good	Excellent.
20	78	Good	Inadequate.	Good	Good	Very good ..	Very good.
.....	38	Inadequate.	Drill hall 35 by 65.	Fair	Fair	Fair	Small.
.....	134	Not good....	None	Fair	Fair	Not good....	Small.
.....	47	Good	Poor.....	Good	Good	Good	Good.
.....	28	Good	Drill hall 40 by 80 is being constructed.	Very good ..	Very good ..	Excellent...	Considerable.
.....	188	Good	None	Good	Fair	Only fair....	Fairly good.
20	198	Ample.....	Ample.....	Excellent...	Very good ..	Good	Great.
20	107	Fair	None	Good	Good	Good	Fair.
39	75	Excellent...	Poor.....	Very good ..	High	Good	Very good.
20	.....	Good	Good	Fair	Good	Good	Good.
.....	85	Good	None	Better than average.	Fair	Good	Fair.
.....	127	Good	Very poor...	Good	Good	Fair	Fair.
9	117	Good	Good	Good	Good	Good	Good.
14	46	Good	Good	Good	Fair	Very mild ..	Fair.
.....	109	Good	Good	Decided	Very great..	Excellent...	Very great.
26	176	Good	Good	Very good ..	Great interest.	Excellent...	Perfectly satisfactory.
.....	485	Very good ..	Very good ..	Excellent...	Excellent...	Excellent...	Great.
.....	44	Campus	Gymnasium	Very good ..	Very good ..	Very good ..	Very good.
17	150	Good	Poor.....	Excellent...	Excellent...	Good	Earnest as a whole.
18	54	Good	None	Good	Considerable.	Good	Great.
.....	105	Good	None	Excellent. .	Excellent...	Excellent...	Very satisfactory.
.....	258	Very poor ..	None	Fairly good.	Fair	Good	Favorable.
15	87	Good	Very limited.	Fair	Fair	Fair	Considerable.
22	60	Fair	Very limited.	Very good ..	Considerable.	Good	Favorable.
19	91	Good	Very poor ..	Good	Good	Fair	Good.

d Voluntary.

e Retired officers as military professors.

Tabulated statements from reports of professors of military science and tactics,

Universities and colleges.	Number of pupils the institution can educate at one time.	Average number of pupils—						Military instruction (hours per week).		Arms (United States property) at institution.		
		Present.	Over 15 years of age.	Capable of military duty	Required enrolled as military students.	That received military instruction.	Uniformed.	Practical.	Theoretical.	Field pieces.	Cadet rifles.	Condition.
Memphis Institute, Memphis, Tenn. *a*	150	23	14	16	22	22	8	5	....	.....	60	30 good; 30 new.
Cumberland University, Lebanon, Tenn.	600	200	175	165	48	54	40	4½	....	.....	100	Good.....
Agricultural and Mechanical College of Texas, College Station.	240	217	217	222	222	222	222	3	....	2	229	Good.....
Baylor University, Waco, Tex.	300	219	204	202	111	103	95	3	2	2	150	Good.....
Austin College, Sherman, Tex. *a*	200	72	66	70	72	72	72	6	....	.....	100	Fair .....
Agricultural College of Utah, Logan.	800	142	142	142	107	107	32	4½	....	2	140	Good.....
University of Vermont, Burlington.	300	200	200	204	204	191	185	8	13½	2	140	Fair .....
Norwich University, Northfield, Vt.	100	43	43	42	43	43	43	4	6	.....	63	Excellent.
Vermont Academy, Saxtons River. *a*	150	53	51	48	44	44	44	4½	....	.....	75	Fair .....
Virginia Agricultural and Mechanical College, Blacksburg.	325	312	309	262	260	260	260	6½	....	2	150	Excellent.
Virginia Military Institute, Lexington.	265	162	162	166	166	166	166	7	6	.....	200	Excellent.
Danville Military Institute, Danville, Va.	100	75	62	74	74	74	74	5	1	2	60	Good.....
University of Washington, Seattle.	500	117	117	(*b*)	59	61	58	2	1	.....	150	Excellent.
Washington Agricultural College, Pullman.	100	120	120	112	108	90	88	5	....	1	150	Good.....
West Virginia University, Morgantown.	500	352	352	349	144	99	99	4	....	.....	127	20 new; rest worn.
State University of Wisconsin, Madison.	(*c*)	1,600	1,600	1,200	363	181	181	2	½	2	395	Good.....
Lawrence University, Appleton, Wis.	250	100	100	95	77	77	77	3	....	.....	100	Good.....
St. John's Military Academy, Delafield, Wis.	175	136	125	140	137	140	137	4	3	.....	.....	.....
University of Wyoming, Laramie.	150	49	49	30	41	41	36	4	....	2	60	Good.....

a Since withdrawn. *b* Not stated. *c* Not limited.

showing average attendance of students at universities and colleges—Continued.

Attendance at—		Facilities for drill.		Students.		Discipline of the institution.	Interest manifested by the faculty.
Artillery drills.	Infantry drills.	Outdoor.	Indoor.	Aptitude.	Interest.		
.....	17	Small back yard and street.	Schoolroom.	Small.....	Not great..	Poor.....	Principal is interested.
.....	32	Good	Good	Good	Usually good.	Lax	By some, good.
.....	184	Excellent...	Inadequate.	Very good ..	Very good ..	Excellent...	Very fair.
14	67	Excellent...	None	Good	Good	Fair	Fair.
.....	54	Good	None	Fair	Fair by one-half.	Not good....	Fair.
.....	96	Good	Poor	Fair	Fair	Fair	Good.
.....	101	Drill ground about 1 mile away.	Hall hired; about 1 mile from college.	Not stated..	No real	None worthy of the name.	No real interest.
18	36	None	None	Very good ..	Excellent...	Excellent...	Excellent.
10	42	Good	Inadequate.	Good	Good	Good	Very great.
33	161	Ample.....	None	Very good ..	Very good ..	Very good ..	Satisfactory.
35	157	Very good ..	None	Excellent...	Excellent...	Excellent...	Excellent.
16	65	Good	Good	Good	Satisfactory	Fair	Satisfactory.
.....	53	Excellent...	Excellent...	Very good ..	Very good ..	Very good ..	Very good.
8	58	Ample.....	Very poor armory.	Good	Good	Fair	Not good.
.....	83	About 2 acres.	Gymnasium and halls.	Fair	Fair	Poor.....	President and about half of the faculty show some interest.
11	173	Ample.....	Ample.....	Good	Good	Good	Good.
.....	68	Drill ground 5 acres.	Armory	Good	Good	Fair	Good.
.....	125	Excellent...	Fair	Excellent...	Excellent...	Excellent...	Very earnest.
27	33	Excellent...	Fair	Good	Good	Good	Good.

REPORT OF THE INSPECTOR-GENERAL.

REPORT

OF THE

INSPECTOR-GENERAL OF THE ARMY.

WAR DEPARTMENT,
INSPECTOR-GENERAL'S OFFICE,
Washington, D. C., October 18, 1897.

SIR: I have the honor to submit the following report of the past work and present condition of this Department, specially affecting the matters under your immediate supervision.

INSPECTION AND INSTRUCTION OF THE NATIONAL GUARD.

The general policy of our nation has never favored in peace times the maintenance of a large standing or regular army, though our growth gives additional importance to our position in the family of nations and lends weight to our judgment, which becomes more and more difficult for others to ignore. Our geographical position with reference to other powers is such that the possibility of war easily appears very remote at any given time and the sudden precipitation of such conditions almost impossible. A regular establishment of sufficient strength to contend, unaided by the militia or volunteers, with any declared enemy has never existed. Therefore we may never hope for a permanent army strong enough to bear unaided even the first shock of hostile demonstration from any power likely to invade our borders, much less to fight a war to a successful termination or to invade the territory of another power; and the fact is self-evident that hereafter, as heretofore, our wars must be fought by volunteers fresh from peaceful avocations, under new relations with their comrades and somewhat unfamiliar with the environment and requirements of campaign, and the organizations of the regular establishment will become a part of this army in all except its designation as "Regulars."

Each succeeding war since the establishment of the Government, through the excessive waste of life and money, has demonstrated that there is no interest of more vital importance than the proper organization and instruction of the militia, and no class of individuals can be more interested therein than the officers of the Regular Army, as their fortunes must be indissolubly joined together for success or failure as comrades in any great war. Every step that can be taken in times of peace toward perfecting this comradeship would seem the part of wisdom, and the importance of this seems to be constantly growing and becoming more clearly recognized. Greater zeal and interest has recently been manifested in military subjects throughout the nation

generally; but this interest is largely maintained through the personal efforts of the members of the several organizations, while often receiving inadequate encouragement from the States or from the General Government. The Secretary of War assigned (vide letter of the Adjutant-General of November 13, 1889[1]) the duty of formulating instructions for officers assigned to the inspection and instruction of militia, and of receiving, considering, and distributing their reports, to the Inspector-General of the Army. About the time this order was made the Association of the National Guard of the United States met in convention in the city of Washington, which afforded an excellent opportunity to elicit the views of the representatives from all the States on the subject of inspection or instruction by officers of the Army.

This office was favored with visits from the president of the association and other prominent representatives of the National Guard; and later, a number of these gentlemen were invited to express their views and indicate their wishes as to the best course to be pursued and methods to be adopted in the inspection and instruction of the National Guard by Army officers at their annual encampments. Valuable responses were received, and the letter of instruction to inspecting officers was made to conform as far as practicable to the views and suggestions expressed by these gentlemen; since which time the interest of this Department in the development of the National Guard, or volunteer militia, has been second to none, and extracts published in former reports will show the interest and the tenor of the instructions, and the spirit shown in this duty under the supervision of the Inspector-General's Department. For instance, in 1891, Col. F. V. Greene, of the Seventy-first New York Infantry, late captain of the Corps of Engineers, said:

I think it would add to the value of these inspection reports if they were invariably made by field officers of the rank of lieutenant-colonel or major, and the selection of inspecting officers to be made as a rule from officers in active service on the plains. It would also be advantageous if officers of the Inspector-General's Department could be sent to one or more of the States having large bodies of troops, like New York, Pennsylvania, or Massachusetts.

The inspection of the regulars, under the supervision of this Department, is believed to be sufficiently beneficial to be maintained; and of course it would be of similar service to these forces, and if the Department can be of service it is not only a duty but also a gratification. If the encampments of the several States could follow each other consecu-

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[1] WAR DEPARTMENT, ADJUTANT-GENERAL'S OFFICE,
Washington, November 13, 1889.

SIR: I have the honor to acknowledge the receipt, by reference from the Secretary of War, of your indorsement of the 29th ultimo, submitting to the Secretary a request of Senator S. M. Cullom for a copy of a recent inspection report of Illinois National Guard encampments, in which you remark that these inspections can be more efficiently conducted through the Inspector-General's Department, and that the present mode of conducting them is a reflection upon the Inspector-General's corps, and request that the original inspection reports of militia be sent to and filed in your office, etc.

I beg to say, in reply, that your views are concurred in by the Secretary of War, and that accordingly hereafter officers of the Army who may be directed by orders from this office to inspect militia organizations or encampments will be instructed to make their inspections and reports under such instructions as they may receive from, and to send their reports direct to, your office.

The original inspection reports covering the past season are herewith transmitted, agreeably to your request, for file in your office. Similar reports made in former years will be sent also, if desired.

Very respectfully, your obedient servant,

J. C. KELTON, *Adjutant-General.*

The INSPECTOR-GENERAL UNITED STATES ARMY.

tively and progressively from year to year, then there might be less impediment in the way of having each of the encampments as instructive as possible, and having the whole system lead through all the experiences of an army, up at least to an army corps, as it would actually appear in war. This can easily be managed without much additional expense, and merely requires a wise and proper combination of what already exists both among the State and national forces.

The most reliable national feeling and effective comradery between the citizens, but especially among the armed forces of the States, must be found and maintained in the National Guard, whether the guard is run wholly on State lines, or with such combinations as the best interests of the military service demand, and which have been exemplified both in camps and rifle practice. All feel that there is a broader and higher view, which everyone recognizes must be immediately accepted in case of war, and could be partially accepted now by mutual consent under those higher patriotic motives which may lie dormant in peace but are the very soul of every branch of the military establishment, whether regular or militia; and it is this view of our present military service, which is but preparatory to the more exacting demands of war, that deserves the most attention.

The appropriation of a more adequate sum by the General Government for the maintenance of the National Guard may be essential to any great or rapid progress. It is the duty of the nation to provide for the common defense—and every dollar spent in wise preparation saves two in war—so it is evident in a purely business way that the General Government can well afford to give a dollar for every dollar raised by a State.

Much more could be said in commendation of these national military forces, and numerous instances could be quoted in evidence of the willingness, readiness, and promptness, with which the volunteer forces respond to calls in time of trouble. But it is known to all men. The militia has done its duty and acquitted itself creditably in the past. It should be supported unstintingly, and the Government could make no expenditure with better results than a liberal provision for its soldiery. The National Guard deserves it, the stability of the Republic and the safety of the people demand it; and the respect for our flag abroad is gauged by the strength of its defenders. And it is believed that the utmost efficiency for war will be advanced by all parts of the military establishment working together intelligently, zealously, and harmoniously, just as they would have to act in war. Perhaps a fair illustration of the good results of this intelligent and patriotic concert of action can be found in the issuance of some of the most important general orders concerning military instruction and practice, and also in some of the books of regulations. This Department has done what it could, and is connected necessarily with every branch of the military establishment where the best discipline, efficiency, instruction, or economy is desired, and it has thoroughly realized the importance of joining hands with the National Guard by all proper means; and it is believed the beneficial intercourse between the two branches of our military establishment—the regulars and the National Guard—was never more pleasant and complete than while it was a recognized part of the duties of this Bureau.

TRAINING OF INFANTRY.

Present military conditions perhaps still permit quoting this summary as to training infantry for approaching battle:

(1) Greatly increased importance of the ground; therefore acquire

familiarity with every variety by every exercise suitable to war and at all hours.

(2) Less élan; a fresh force at the last; a turning as well as front movement.

(3) Effective reconnoitering; the best trained officers promise victory.

(4) Accurately judging distance.

(5) The spade is raised almost to the rank of a weapon.

(6) Instruction; ignorance is a military crime; officers must not only master their business but perfect themselves as instructors able to arouse enthusiasm for the cause; not only the captain and other leaders must be skillful and determined, avoiding unnecessary losses, but the individual infantryman should be a good shot, a skillful skirmisher, a determined soldier, well knowing how he is to act in every situation of the fight, and trusting in his own capacity; and losses must be met with courage as well as skill, though at the most important distances—when the opponents are close together—the danger of death is possibly not so great as formerly.

(7) Gymnastics, fencing, overcoming obstacles, fighting in masses, long-range firing, developing the best mental condition, so the individual and his organization will be evidently well trained.

REGIMENTAL CAVALRY POST.

In view of the tendency to move some of the Army eastward, it would probably be highly beneficial to establish a regimental cavalry post at some point in the Ohio Valley, east of the Mississippi River.

NONCOMMISSIONED OFFICERS.

We can not recognize too clearly that modern warfare makes enlarged demands upon the abilities of noncommissioned officers, and their character, instruction, and familiarity with responsibility is of very special importance to us, as from them we take a considerable number of our officers; and it would be well if all the enlisted men could be as efficiently brought into a single system of schools as all the commissioned class have been, and better results thus be attained with less labor.

GOOD-CONDUCT BADGES.

Attention was invited in a previous report to the need of some system of rewards for good conduct; but the subject is of such importance and so intimately related to the discipline of our Army as to deserve further mention. Some armies have adopted a system of good-conduct pay and badges and have derived marked benefit therefrom; and its introduction into our Army would prove equally beneficial.

The total number of men in the Army worthy of good-conduct badges was formerly stated to be 4,614, and over 17,500 men were reported as not having been tried, and 20,580 had not been in confinement, or 79.4 and 92.9 per cent, respectively, of the total number of enlisted men reported present and absent. These figures bring the troublesome element within 10 per cent, and speak well for the Army; and they are a fair indication of the behavior of our troops.

It is safe to say that the adoption of good-conduct badges would improve the morale of our Army, and supplement the much-valued medals of honor and certificates of merit, which are hardly within reach in quiet times of peace.

MANEUVERS.

The distinctive quality of soldiers is their ability to act efficiently in masses under all circumstances, according to the will of one man. Individually the unsoldierly may or may not be superior; but collectively the power of rigid discipline is recognized. It is gratifying to note, therefore, that gymnastics, target practice, practice marches, and the professional and practical illustration and solution of ordinary military problems (or in other words, collective as well as individual training) are receiving increasing consideration and attention among our national forces. Some States have already inaugurated consolidated encamp ments of their military forces with beneficial results. It is only a step further to bring the troops of several States into one camp, and it is earnestly recommended that this be done. With the present rate of shrinkage in the ranks of our veteran officers who are able to handle large bodies of troops, there will soon be no one left possessed of experience gained in the late war. Our standing Army is too scattered to permit the concentration of a corps into one camp without great expense, but never too much so to be able to attend in limited numbers a consolidated encampment of several States. Money could not be expended for a better and wiser military purpose.

ARMY AND NAVY SMALL ARMS.

Our Navy has adopted .236 as the proper caliber for small arms, while our army rifle, the Krag-Jorgensen, is caliber .30; and this may prevent the interchangeability of ammunition between the two services. A difference of 25 per cent between the two services as to the theoretically perfect caliber seems excessive, and might be reconciled.

It would not be uninteresting to note through what nationalities and during what years the calibers decreased from .69 to .58, or .57 to .45, till at last .236 is reached.

Reductions in caliber have accompanied greater initial velocity, a flatter trajectory, greater range and penetration, and less shock of recoil, with the additional advantage of allowing each man to carry a greater number of rounds. So in recent years instead of bloodshed there has been a battle of rearmaments.

DESTRUCTION AND SALE OF STORES.

In regard to the sale of stores, it seems only right that all bureaus of the War Department be treated fairly alike, and the general law on this subject, passed in 1825, has been found to answer for more than seventy years and gives to the Secretary of War the fullest powers, and has in it the essential quality, of insuring fair publicity and the disinterested judgment of officers not connected with the bureau responsible for the property it is desired to eliminate, in the wisest manner, from the public service. This law affects all military stores or supplies and has been carefully guarded, and deserves consideration again in connection with recent enactments. It is as follows:

AN ACT to authorize the sale of unserviceable ordnance, arms, and military stores.

That the President of the United States be, and he is hereby, authorized to cause to be sold any ordnance, arms, ammunition, or other military stores, or subsistence, or medical supplies, which, upon proper inspection or survey, shall appear to be damaged or otherwise unsuitable for the public service, whenever, in his opinion, the sale of such unserviceable stores will be advantageous to the public service.

SEC. 2. That the inspection or survey of the unserviceable stores shall be made by an inspector-general, or such other officer or officers as the Secretary of War may appoint for that purpose; and the sales shall be made under such rules and regulations as may be prescribed by the Secretary of War.

Approved, March 3, 1825.

The work done and amounts involved under this head deserve particularly careful attention. What has been the percentage of loss under any appropriation and where it has been largest or with a tendency to increase during the past decade can doubtless be shown by the records of each office and bureau. The totals for the present year shown in this office are 3,382,088 articles, including units of weight and measure, which, from the most accurate approximation possible, appear to have cost when new about $2,459,251.61. Of this, property costing, when new, approximately $1,662,956.98 was condemned and $796,294.63 was retained in service.

LEGAL ESTABLISHMENT OF INSPECTIONS.

The duties of the bureaus of the War Department have been partly established by law and partly by orders and partly by immemorial custom, and the Inspector-General's department is not an exception to this rule. The designation of subsistence stores kept for sale, and the inspection of army disbursements and unserviceable property, and the Soldiers' Home, District of Columbia, and the Home for Disabled Volunteers, have been legally established. Duties so established by law end discussions; their continuance and steadfastness are assured, and evidently the general inspection of the Army should be constant, rather than spasmodic, thorough, and not perfunctory. All admit that inspectors should inspect, and inspect all fairly alike. If there is any temptation for others to assume, deflect, or thwart their proper functions, it can hardly be for the permanent good of the public service.

To accomplish the best possible results, the Inspector-General's department should have an adquate permanent force of independent inspectors. According to Army Regulations, the inspector's sphere of inquiry includes every branch of military affairs. In war times the inspections were monthly, and there were about 500 inspectors. Now disbursements are in this way only inspected triyearly or less, and commands annually, and ungarrisoned fortifications, etc., biennially, so the number of inspections have necessarily long since been minimized, as the inspectors are so few. Evidently inspections should be made thoroughly and impartially in all cases and the duties should be adequately met. This can not be done more effectually than by clearly establishing the duties of the department by law and giving to it a number of permanent officers sufficient for the performance of these duties. This has been often recommended by the ablest authorities.

PUBLIC WORKS.

The system of accountability and the measures taken by the officers in charge of the construction and repair of military works and of river and harbor improvements, in addition to what is prescribed in the regulations, while differing somewhat in character, have been on the whole very satisfactory, and indicate a most zealous, intelligent, and conscientious purpose to carry on these important public works with skill and economy. It would appear desirable that our officers should

have the fullest confidence in and responsibility for their employees, and be relieved as much as possible from office details and routine, so that they may give all the time possible to visits of inspection and supervision. That, under the circumstances attending their work, officers are not frequently involved in serious financial and professional difficulties is the best evidence of their painstaking and intelligent supervision and the integrity and ability of their assistants.

SOLDIERS' HOME.

Under the act of March 3, 1883, the Inspector-General of the Army is required to make, in person, once in each year, a thorough inspection of the Home, its records, accounts, management, discipline, and sanitary condition, and make report thereof in writing, together with such suggestions as he desires to make. During the past year the inspection was made in November, 1896, and report thereof submitted on the 16th of the month following, accompanied by the usual statistics concerning the inmates, expenditures, contracts, supplies, and other information.

The buildings and grounds were generally in excellent condition and police. The débris of the hurricane of September 29, which uprooted or damaged 450 trees, as well as the roofs of some of the buildings, had nearly all been cleared away.

The new amusement hall erected during the year at a cost of over $60,000 was nearly, and is since, completed, and it is hoped will prove a gratification and benefit to the inmates of the Home. There is no public canteen or exchange on the grounds [though the privilege of selling cigars, etc., is given an inmate] and the sale of intoxicants within a radius of 1 mile of the Home is prohibited by law.

The excellent condition of the grounds and roadways of this expensive reservation (502 acres) reflects much credit upon the management.

During the year ending September 30, 1896, the average number of officers and members present was 688, with an average of 380 absent. The field return of October 15, 1896, showed a total membership of 1,113, of whom 724 were present and 389 absent. Of the absentees, 322 received outdoor relief, 45 were on furlough, 18 in the insane asylum, and 4 on suspension. The average number receiving outdoor relief during the year was 318.58, who were paid a total of $26,471.06, or an average of $83.09 each. In this connection I beg leave to suggest that this plan of giving relief is authorized by law, and if practically adopted by the National Home for Disabled Volunteer Soldiers according to this same form and with proper limitations, would enable that institution to care for many worthy and helpless old soldiers, especially those with families, who under the present arrangements apply in vain for admission. It is evident that this Home would be as unduly overcrowded as the Volunteer Home if all were present.

The length of service of the 724 men present at the Home was between five months and thirty years, with an average length of 14.69 years; 575 received pensions ranging from $6 to $70 per month, with an average of $11.78.

The disbursements and accounts of the Treasurer appeared correct and the records neatly kept, but the practice of keeping cash balances on hand would seem to be unnecessary when a United States depository is available. It was also noted that instead of taking a receipted voucher from each person to whom a payment was due, and making the abstract a record of all disbursements made, and to whom made, as

required by law, reimbursements were entered for cash payments. It is submitted that the books and accounts presented for inspection under the law are similar to public accounts, and should be used and recognized as the only official accounts of the Home. No property books were exhibited in the treasurer's office, and the returns appeared to have been made up from the purchase vouchers every six months. The method of competitive bids adopted during the past year for the purchase of many articles has apparently been advantageous to the Home and could perhaps be extended.

The balance of the permanent fund on hand September 30, 1895, was..	$2,690,042.83
Credit settlements	145,700.49
Total	2,835,743.32
Withdrawn for current expenses	124,618.80
Balance September 30, 1896	2,711,124.52

The growth of this fund for the past five years has been nearly $300,000, though the receipts for several years have been diminishing. The annual expenses, exclusive of permanent improvements, have been reduced to $146,415.82, of which nearly $81,000 was met from the interest of the permanent fund; and the expense per capita was reduced from $188.01 to $171.71, which, compared with last year's expense, gives a reduction of $16.30, and with that of the preceding year, of $26.18. The ratio of employees to average membership has been about 39 per cent, which is slightly less than for the previous year, and must be considered in connection with the large and attractive grounds and the fact that officers, noncommissioned officers, and band are included. Including members on outdoor relief, the per capita becomes $143.66, which is $10.30 less than last year and $19.81 less than the year before last.

The hospital was found in its usual excellent condition under the present management, and the sick well cared for; but the dining room seems too small, as the tables have to be set three times for each meal.

The consideration shown the old soldiers is commendable, and what is fairly practicable appears to have been done for their comfort and contentment, and the discipline has been good. The many details connected with the administrative and executive duties requires constant attention, and to this end another officer might be added advantageously to the four staff officers of the Home.

NATIONAL HOME FOR DISABLED VOLUNTEER SOLDIERS.

The inspection made during the fiscal year just closed of this great institution, as required by law, covered a period of fourteen weeks for an examination of the whole plant, valued approximately at $7,500,000, and of the methods, more or less intricate, of its fiscal department and its great mass of accounts and vouchers, which aggregated more than $5,000,000. The examination also included a glance at the extensive and complicated system of records; the supply departments, with their great variety of property and stores valued at hundreds of thousands of dollars; the hospitals and medical departments, with thousands of patients; its hundreds of buildings; and its population of more than 18,000 men, ever steadily growing; and innumerable details of inspection, slight in themselves, perhaps, but considerable in the aggregate.

The report of this inspection was submitted to the Secretary of War on February 4, 1897, and was by him transmitted on February 6, 1897,

to Congress, where it was printed as House Doc. No. 274, second session Fifty-fourth Congress.

The Branch Homes were found generally in good condition in almost every important particular; many of the buildings were all that could be desired as to care and condition, and the grounds, as a rule, were well kept. No deterioration was noted anywhere. The admirable and economical system of repairing and cleaning outside clothing at some of the Branches, and especially the repair of wire-woven spring beds, might be readily and easily adopted in the Army. But attention has been invited in a previous report to the unnecessary waste in this matter of unrepaired property when worn or injured, and perhaps the time is not yet ripe to effect any change.

During the fiscal year 1897 the population of the Home, as shown by the trimonthly reports from the Branches, ranged from 17,304 on July 10, 1896, to 18,685 on February 20, 1897; and the average population for the entire year was 18,178, a net gain of 727 over the preceding year. The net gain in population since 1893 is 3,517, while the number of barracks erected since then has been 12.

While the appropriation for the fiscal year 1897 was less than that for the fiscal year 1896, and notwithstanding a net gain of 727 in average population during the year, still the average cost of maintenance per capita for 1897 was only $121.15 as against the average cost of $126.08 for 1896, a decrease of $4.93. The average yearly cost of maintenance at the Home (notwithstanding a yearly growth in population and regularly decreasing appropriations for maintenance) has recently been marked and steady. The law has been modified now, and it will be interesting to note if a change of method is not again accompanied by a difference in expense. The decrease per capita since 1894 is shown by the following table:

Year.	Population.	Expense per capita.
1894	15,601	$141.41
1895	16,480	128.78
1896	17,451	126.08
1897	18,178	121.15
Decrease per capita since 1894		20.26

During the year the accounts have been received promptly and the only delay worth mentioning may be in some requisitions or in the response to suspensions, or exceptions occasionally, and the general improvement in the manner and methods of doing business has been very marked indeed, and if it has, as believed, resulted in saving to the public, it is certainly without in any way decreasing the comforts and conveniences of the old soldiers. And it is believed that the authorities of the Home and its Branches generally would gladly welcome any wise and prudent suggestions calculated to throw additional safeguards around their own interests, as well as the interests of the veterans and of the public.

During the past year there has been no increase in the number of the defects and irregularities found in examining the vouchers over those noted during the preceding year, and they are generally of the same character. The main difficulty encountered seems to be as to what subheads of appropriation certain expenses should be charged. For instance, why should more be paid for coffins merely because carpenters or lumber are not mentioned in the appropriation for hospitals? There

has also been more or less carelessness in transcribing the names of deceased members who left posthumous effects, so the funds occasionally appear taken up under one name and to be paid out under a different (though somewhat similar) one, though the utmost care should be exercised in keeping records relating to the property of deceased members with the strictest accuracy. When the Government receives in trust this posthumous money, like it receives soldiers' deposits, surely it should be perfectly prompt in paying the heirs what is justly their due. The law seems to fully authorize these disbursements from current expense appropriations as well as directly from the funds received from the men, but nevertheless there appears to have been some cases of untoward delay; and there was some complaint again this year about delay in receiving pay for services.

The following is a summary of the receipts and disbursements for the fiscal year ending June 30, 1897:

STATEMENT A.—*Receipts and disbursements, National Home for Disabled Volunteer Soldiers during fiscal year 1897.*

	Fiscal year—				Total.
	1894.	1895.	1896.	1897.	
General fund.					
Balance on hand June 30, 1896	$7,222.02	$65,704.74	$275,774.56		$348,701.32
Received from Treasury	1,309.10		29,900.00	$2,463,113.10	2,494,322.20
Posthumous fund, act Aug. 18, 1895				49,451.15	49,451.15
Sales, etc			3,303.13	55,623.69	58,926.82
Transfers and disallowances	2,755.20	82.77	838.08	1,662.97	5,339.02
Total	11,286.32	65,787.51	309,815.77	2,569,850.91	2,956,740.51
Accounted for as follows:					
Disbursements	1,309.10	83.72	190,746.96	2,361,326.15	2,553,465.93
Deposited in Treasury as surplus	9,977.22	62,810.39	99,785.68		172,573.29
Transfers and allowances		2,755.20	71.34	2,353.64	5,180.18
Total	11,286.32	65,649.31	290,603.98	2,363,679.79	2,731,219.40
Balance on hand June 30, 1897		138.20	19,211.79	206,171.12	225,521.11
Total	11,286.32	65,787.51	309,815.77	2,569,850.91	2,956,740.51
State aid funds.					
Balance on hand June 30, 1896			53,093.16		53,093.16
Received from Treasury		18,799.74	150,000.00	576,250.00	745,049.74
Total		18,799.74	203,093.16	576,250.00	798,142.90
Accounted for as follows:					
Disbursements		18,799.74	181,510.23	564,463.78	764,773.75
Deposited in Treasury as surplus			21,582.93		21,582.93
Total		18,799.74	203,093.16	564,463.78	786,356.68
Balance on hand June 30, 1897				11,786.22	11,786.22
Total		18,799.74	203,093.16	576,250.00	798,142.90

The appropriation accounts for the various fiscal years may be summarized as follows:

STATEMENT B.—*Appropriations.*

Appropriations.	Fiscal year.					Total.
	1893 and prior.	1894.	1895.	1896.	1897.	
General fund.						
Balance in Treasury July 1, 1896.	$1.00	$1,427.39	$213,977.17	$134,900.00	.....	$350,305.56
Amount of appropriations	.....	.....	.....	.....	$2,483,478.75	2,483,478.75
Unexpended balances deposited by general treasurer	.....	9,977.22	62,810.39	99,785.68	.....	172,573.29
Total	1.00	11,404.61	276,787.56	234,685.68	2,483,478.75	3,006,357.60
Remitted to disbursing officers	.....	1,309.10	.....	29,900.00	2,463,113.10	2,494,322.20
Paid on Treasury statements	.....	.....	.....	379.31	4.86	384.17
Covered into surplus fund	1.00	10,095.51	276,787.56	.....	.....	286,884.07
Total	1.00	11,404.61	276,787.56	30,279.31	2,463,117.96	2,781,590.44
Balance in Treasury June 30, 1897	.....	.....	.....	204,406.37	20,360.79	224,767.16
Total	1.00	11,404.61	276,787.56	234,685.68	2,483,478.75	3,006,357.60
State-aid funds.						
Balance in Treasury July 1, 1896.	.....	199.53	18,799.74	150,000.00	.....	168,999.27
Amount of appropriations	.....	.....	.....	.....	725,000.00	725,000.00
Unexpended balances deposited by general treasurer	.....	.....	.....	21,582.93	.....	21,582.93
Total	.....	199.53	18,799.74	171,582.93	725,000.00	915,582.20
Remitted to disbursing officers	.....	.....	18,799.74	150,000.00	576,250.00	745,049.74
Covered into surplus fund	.....	199.53	.....	.....	.....	199.53
Total	.....	199.53	18,799.74	150,000.00	576,250.00	745,249.27
Balance in Treasury June 30, 1897	.....	.....	.....	21,583.93	148,750.00	170,332.93
Total	.....	199.53	18,799.74	171,582.93	725,000.00	915,582.20

There was received during the past fiscal year from the effects of deceased members or "posthumous fund" the sum of $19,451.15, and paid out on the same account the sum of $25,466.47, leaving a balance of $23,984.68 to be added to the appropriation for "current expenses" at the Branch Homes, as follows:

Branch.	Amount received.	Amount expended.	Balance to current expenses.
Central	$20,014.83	$11,741.31	$8,273.52
Northwestern	6,424.60	3,273.47	3,151.13
Southern	6,854.64	3,470.69	3,383.95
Eastern	4,902.80	1,623.54	3,279.26
Western	6,925.99	2,978.91	3,947.08
Pacific	1,985.09	796.61	1,188.48
Marion	2,343.20	1,581.94	761.26
Total	49,451.15	25,466.47	23,984.68

The transfer of posthumous funds to the appropriation for current expenses, since this was required to be done by the act of August 18, 1894, has been as follows:

	Received.	Disbursed on posthumous account.	Balance to current expenses.	Covered into the Treasury.
Amount transferred 1894	a $152,232.63	.....	b $123,058.74	$29,173.89
Amount for fiscal year 1895	46,954.98	$22,143.56	24,811.42	24,811.42
Amount for fiscal year 1896	43,674.74	22,841.63	20,833.11	20,833.11
Amount for fiscal year 1897	49,451.15	25,466.47	23,984.68	23,984.68
Total	292,313.50	70,451.66	192,687.95	98,803.10

a $29,173.89 of this was covered into the Treasury. b 1895.

Using the posthumous funds under the appropriation for the current expenses, thereby making them available for immediate use and temporarily relieving the Branches and the Treasury to that extent while the funds are being collected and transmitted through the Home to the United States Treasury, is exactly in accord with precedents established by law for other soldiers which have worked to the satisfaction of all concerned. Evidently the United States is now the trustee and the funds are always available for the heirs of the deceased members when their claims are satisfactorily established, and there are instances where such claims have been paid more than twenty years after the death of a member. If any better trustee or method of making this fund useful or safe has been discovered its announcement has not been seen. But whatever method is adopted, evidently as long as the receipts are nearly twice the disbursements the heirs should receive their dues promptly.

The following is a brief statement of the appropriations, the net disbursements, and unexpended balances relating to the several fiscal years involved:

	1893.	1894.	1895.
Appropriated	$2,618,013.67	$2,379,872.99	$2,324,473.00
Posthumous fund	.....	.....	a 152,232.63
			24,811.42
Total	2,618,013.67	2,379,872.99	2,501,517.05
Net disbursements	b 2,505,224.98	2,197,441.06	2,224,591.29
Balance unexpended	112,788.69	182,431.93	276,925.76
Total	2,618,013.67	2,379,872.99	2,501,517.05
In United States Treasury	.....	.....	.....
Covered into Treasury on surplus warrants	112,788.69	182,431.93	276,787.56
In hands of disbursing officers	.....	.....	138.20
Total	112,788.69	182,431.93	276,925.76

a Act of August 18, 1894. b Disbursements, less proceeds of sales and repayments.

	1896.	1897.	Total.
Appropriated	$2,514,846.00	$2,483,478.75	$12,320,684.41
Posthumous fund	20,833.11	23,984.68	221,861.84
Total	2,535,679.11	2,507,463.43	12,542,546.25
Net disbursements	2,312,060.95	2,280,931.52	11,520,249.80
Balance unexpended	223,618.16	226,531.91	1,022,296.45
Total	2,535,679.11	2,507,463.43	12,542,546.25
In United States Treasury	204,406.37	20,360.79	224,767.16
Covered into Treasury on surplus warrants			572,008.18
In hands of disbursing officers	19,211.79	206,171.12	225,521.11
Total	223,618.16	226,531.91	1,022,296.45

When the estimate is received in time the remittance is usually made to the Home from Washington in the first half of the month. The monthly disbursements from these appropriations averaged about $257,000, including State Home funds, so the amount on deposit during the first quarter of this fiscal year seems larger than is usual among the disbursing officers inspected by this Department. The largest and smallest sums reported by the Treasury were $604,178.04 on January 31, 1897, and $334,438.54 on Augest 31, 1896.

The subjoined tabulation shows the amount appropriated for maintenance of members and for special constructions for the fiscal years involved, viz:

Fiscal year.	Average membership.	Appropriation.	For special construction.	For maintenance.
1893	14,661	$2,618,013.67	$207,540.00	$2,410,473.67
1894	15,601	2,379,872.99	1,309.10	2,378,563.89
1895	16,480	2,324,473.00	94,100.00	a 2,230,373.00
1896	17,451	2,514,846.00	173,500.00	2,341,346.00
1897	18,178	2,483,478.75	161,814.75	2,321,664.00
1898	.....	b 2,566,346.00	b 229,800.00	2,336,546.00
Total	82,371	14,887,030.41	868,063.85	14,018,966.56

a Exclusive of $123,058.74 appropriated from posthumous fund.
b Including $150,000 for the construction of a new Branch at Danville, Ill.

The annual inspection of the National Home for Disabled Volunteer Soldiers is now in progress, and all the Branches but the Southern have been visited. The same enthusiastic sense of duty and energy in its performance generally prevails, and the commendable condition and some hitherto reported evils continue. The latest census received (September 30, 1897) shows 18,572 present, a net gain of 153 since September 10, 1896. The ground for new Branch at Danville has been acquired and the contract for some building made, beginning with the hospital. At the other Branches the additions have been in part: Eastern, new barn; Southern, addition to latrine, new gasoline plant, sewage pumping works; Western, insane ward, renewal of steam pipes, amusement hall from post fund; Pacific, additional barrack, boiler house and stack; Marion, three new barracks, a new boiler house and a new gas well; Central, additional chapel from post and Ward funds.

Among matters apparently deserving prompt remedial attention occasionally, perhaps may be mentioned the need of certain sizes of shoes; tardy deposit of moneys and untested checks; dormitories nearly under-

ground or in dark crannies, ill ventilated or overcrowded: unlaundered underclothes, dirty towels and bedding, etc. And doubtless the mention of such items in previous reports has insured their receiving such attention as was deemed needful or possible. Whether the marked difference in the death rate at the several Branches without a corresponding difference in sites has any remedial causes may also deserve the most careful consideration. The tender by the Surgeon-General of the Army of a thoroughly experienced and competent surgeon to act as medical director would, if accepted, seem fairly economical, insure a suitable supply of medicines, etc., a proper control and management of the hospitals, and lead to the wise consideration of hygienic and sanitary conditions throughout the Homes and well-informed judgment thereon. So simple and effective a solution of a condition in which apparently the lives of men are involved appears to have something in it that should commend it. In this connection it might be well to test whether the cleanest and best ventilated Home is also the healthiest, and what has been the effect of water and site and food and dormitories upon health.

DISBURSEMENTS.

The reports of the inspections required by law of the money accounts of disbursing officers of the Army and others for the fiscal year ending June 30, 1897, may be summarized as follows:

Balances taken up		$4,853,592.25
Receipts from Treasury	$47,439,027.18	
Receipts from sales and other sources	2,367,986.73	
		49,807,013.91
Transfers from others officers		15,523,866.78
Error in addition, Eastern Branch National Home for Disabled Volunteer Soldiers		.40
Total to be accounted for		70,184,473.34
Disbursements	$49,577,037.91	
Deposited to credit Treasurer United States	1,259,170.08	
	50,836,207.99	
Transferred to other officers	13,796,431.11	
		64,632,639.10
Balance		5,551,834.24
Balance distributed as follows:		
United States Treasury	$4,179,454.96	
United States depositories	1,296,890.24	
Cash on hand	75,489.04	
		5,551,834.24

Of the $75,489.04 reported as cash on hand, the sum of $58,300 in State bonds and $2,354.88 cash safe-deposit vault was held by an officer of the National Home for Disabled Volunteer Soldiers, and $229.80 was held by the treasurer of the United States Soldiers' Home, which was $183.98 less than at the close of the previous fiscal year, leaving only the sum of $14,604.16 cash in the hands of disbursing officers of the Army at the close of the fiscal year as against $17,066.97 for the preceding year. This is 0.0003+ per cent of the entire year's disbursements

by them. It seems preferable for the best accounting that the balance on hand, but especially the actual cash, shall be kept at the minimum. The extreme and average cash with Army disbursing officers were, respectively, $3,830.37 and $35.32, and in depositories, respectively, $204,653.88 and $8,861.81.

The disbursements for the past four fiscal years may be designated in groups as follows:

	1894.	1895.	1896.	1897.
Army disbursements	$29,943,766.34	$28,632,335.86	$26,594,408.37	$29,873,506.27
River and harbor disbursements	18,777,043.89	21,455,330.44	18,275,977.87	14,357,562.56
Other civil disbursements	1,122,131.48	7,473,534.38	6,359,617.86	5,345,969.08
Total	49,842,941.71	57,561,200.68	51,230,004.10	49,577,037.91

The statement above shows a decrease of $1,652,966.19 from the amount inspected during the preceding fiscal year, which is accounted for by the following statement:

Decreased disbursements:		
Engineer Department		$3,918,415.31
Recruiting officers		7,106.16
National Homes for Disabled Volunteer Soldiers		1,161,061.39
Miscellaneous		121,185.26
		5,207,768.12
Increased disbursements:		
Adjutant-General's Department	$366.93	
Quartermaster-General's Department	434,744.27	
Subsistence Department	453,792.95	
Ordnance Department	552,949.65	
Pay Department	1,769,791.40	
Medical	343,156.73	
		3,554,801.93
Net decrease		1,652,966.19

During the past seven fiscal years the relation between the total amount involved and the disbursements, transfers, deposits in the Treasury, and balances on hand appears as follows:

	1891.	1892.	1893.	1894.	1895.	1896.	1897.
Disbursements	0.669	0.703	0.727	0.760	0.756	0.710	0.706
Transfers between officers	.214	.212	.191	.163	.158	.207	.197
Deposited in General Treasury	.014	.027	.025	.015	.018	.013	.018
Balances on hand	.103	.058	.057	.062	.068	.070	.079

This statement shows improvement in some respects over the preceding year's transactions and deterioration in other respects. There is an improvement of more than 1 per cent in transfers and a falling back of nearly 1 per cent in balances on hand.

The average monthly disbursements of officers of the Army for the year was $3,686,922.40, and their final balances represented 118 per cent of this average, as against 114 in 1896, 103 in 1895, and 89 in 1894. At the Soldiers' Home, Washington, D. C., the final balances represented 46 per cent of the average monthly disbursements in 1894, 192 per cent in 1895, and 102 per cent in 1896.

The following table shows the variation of these percentages in the principal disbursing departments during seven fiscal years, viz:

Department.	Percentages.						
	1891.	1892.	1893.	1894.	1895.	1896.	1897.
Engineer	293	104	82	75	83	116	133
Ordnance	191	124	105	115	139	113	130
Quartermaster	130	53	120	135	179	170	161
Subsistence	102	99	39	73	119	89	109
Medical	82	102	186	83	131	205	71
Pay	57	48	90	66	83	77	101
Average for the Army	191	99	94	88	107	125	118

The proportion of balances kept in personal possession by officers of the Army was about 0.0026 of the whole amount, as against 0.0030 for the preceding year, a slight improvement.

The total number of inspections made, including statements made under Army Regulations, paragraph 877, verified by the inspector, was as follows:

Accounts.	1894.		1895.		1896.		1897.	
	Officers.	Inspections.	Officers.	Inspections.	Officers.	Inspections.	Officers.	Inspections.
General staff officers	233	604	235	588	211	546	216	558
Post staff officers	219	811	205	536	178	292	176	352
Other line officers	37	48	10	12	22	33	18	23
Soldiers' Homes	5	5	8	8	10	10	10	10
Disbursing clerk, War Department			1	1				
Total	494	1,468	459	1,145	421	881	420	943
Average for each staff officer	2.6		2.5		2.1		2.5	
Average for each post officer	3.7		2.6		1.6		2.0	

Of the 943 inspections, involving $70,184,472.94, it appears from the following tabulation that 802 inspections (including 250 accounts of post officers), involving $67,975,315.22, were made by officers of this Department, and 14 inspections (wholly in the Quartermaster and Subsistence Departments, and none of which were of staff officers), involving $25,057.55, were made by other officers:

Department.	Officers inspected.	Inspections.	Amount involved.
Adjutant-General	10	22	$4,062.80
Quartermaster-General:			
Staff	60	160	13,219,487.04
Post	87	172	1,127,593.04
Subsistence:			
Staff	24	60	1,901,993.69
Post	89	180	921,379.66
Medical	6	14	771,769.93
Pay	24	71	21,958,723.52
Engineer	64	172	16,605,874.87
Ordnance	25	50	4,934,439.60
Recruiting officers	11	14	4,383.80
National Homes for Disabled Volunteer Soldiers	9	9	8,229,326.86
Miscellaneous	11	19	505,438.13
Total	420	943	70,184,472.94

Department.	By officers of Inspector-General's Department.		By other officers.		Under Army Regulations, paragraph 877.	
	No.	Amount.	No.	Amount.	No.	Amount.
Adjutant-General	22	$4,062.80				
Quartermaster-General:						
Staff	143	12,776,455.23			17	$443,031.81
Post	121	765,017.60	7	$13,891.36	44	348,684.08
Subsistence:						
Staff	53	1,810,695.46			7	91,298.23
Post	129	693,144.60	7	11,166.19	44	217,068.87
Medical	14	771,769.93				
Pay	70	21,572,852.24			1	375,871.28
Engineer	167	16,226,134.49			5	279,740.38
Ordnance	48	4,657,842.46			2	276,597.14
Recruiting officers	12	3,833.01			2	550.79
National Home for Disabled Volunteer Soldiers	9	8,229,326.86				
Miscellaneous	14	464,180.54			5	41,257.59
Total	802	67,975,315.22	14	25,057.55	127	2,184,100.17
Per cent of total		.968+		.0003+		.031+

APPLYING SAVINGS.

If the form of the law in the pay and subsistence departments were applied to other bureaus, so all but the exceptional appropriations could be expended under one head, it ought to make it possible to save money. The minuteness of the details, both in appropriations and allotments, sometimes works injuriously.

DEPOTS.

Subsistence Department.

The affairs of the army depots have generally been well administered, as usual. For many years after the recent civil war the practice, which was rendered absolutely necessary by that fact, of purchasing huge quantities of supplies and storing them in depots prevailed largely, if not entirely, in respect to subsistence and all other supplies required for the Army. With the concentration and sedentary duties of the Army and the increase in the number and location of commercial centers this system has gradually given way to another, which has been found adequate to meet the wants of the Army, and far more economical, and attention is invited to the beneficial change, which tends, too, to secure fresher and more suitable supplies.

In place of storing all purchases in depots and shipping from thence to posts, they are inspected as purchased and shipped from the warehouses of merchants to the posts, thus securing promptness of delivery to the consumer and saving to the Government the transportation to and from the depot warehouses and the cost of repacking. This system of handling and shipping subsistence supplies has now been extended to all the purchasing points mentioned in the reports except three, though at one of these also a large part of the stores purchased follow this rule.

Major Moore reports in regard to one that—

> Stores kept on hand are a reserve supply of nonperishable articles for posts and all articles of subsistence stores for sales to officers and for issue to civilian employees of the Quartermaster's Department.

In regard to another, Colonel Burton says on this point:

> They ship from merchants' warehouses direct to posts issue, and family flour, but such articles of great bulk as potatoes, onions, etc., are first brought to the ware-

rooms to verify weights, to examine, and to compare them with samples upon which awards are made.

To my question as to whether it would not be more economical to have such articles shipped direct to posts or to the wharf for the harbor posts the officer in charge replied that "there being no regular authorized inspector designated for the particular purpose, it is absolutely necessary that these and all other stores purchased, which are not acted upon by an authorized inspector, should be delivered at the depot to prevent substitution and deception."

I can not understand why such stores could not as readily be examined at the merchants' warerooms by the same employees who are now performing this duty in the depot warerooms, and by doing this save the Government cost in transportation, as the merchants could, after the stores have so been examined and weighed, deliver them to the posts, or to freight depots, or to the wharves.

Colonel Vroom calls attention to this as follows:

The question naturally arises, Is it for the best interests of the Government to purchase supplies that could be purchased in St. Louis at Chicago, New York, Boston, and New Orleans and ship them via St. Louis to their destination? The number of such shipments through St. Louis during the fiscal year ended June 30, 1896, was 93, and their total weight 269,564 pounds. It will hardly be claimed, I think, that any difference in prices that might exist between St. Louis and the points before mentioned would compensate for the loss in freight charges sustained by the Government. Take, for example, the shipment of February 24, 1896, from New York to Fort Clark, Tex. This shipment consisted of 6 boxes of olives, 4 cases of cranberry sauce, and 2 cases of Worcestershire sauce. The weight was 648 pounds and the freight charges from New York to St. Louis were $4.41.

The total amount reported as expended for subsistence supplies during the past fiscal year was about $853,680.57. The cost of disbursing this amount was apparently about $91,001.42.

Colonel Hughes reports:

Medical Department.

There are about 280 chairs now on hand. Some two hundred of these are of a quality that cost 65 cents each. They occupy a room in this building, and rentals are too high in this locality to authorize such employment of space. It would seem feasible to purchase chairs of this quality in the vicinity of a very large majority of our posts, and it would certainly be economical to do so instead of buying them here and having them transported to distant posts at the expense of the Quartermaster's Department.

A lot of granulated sugar has just been delivered to be tinned for shipment to posts as hospital stores. The Medical Department can not buy any better sugar than I saw in the Subsistence Department on another floor. As the latter Department supplies sugar to all the military posts, the necessity for buying and tinning sugar by the Medical Department for post hospitals is not quite apparent to me.

The volume of business in the office of the medical depot is diminishing, but the office force seems to be the same. An examination of the accounts for the past eight months indicates that the purchases amounted to about $25,000, and during the same period the pay rolls of the office force footed up $6,400, or over one-fourth of the total volume of business measured by the money involved.

Colonel Burton says:

The experience of the officer in charge is in favor of purchasing all stores here as they are needed. There is about 10 per cent difference in favor of San Francisco between the aggregate cost of stores purchased here and those received from Eastern depots. * * * It certainly appears to me that fresh supplies would be an advantage. As it is at the present time, three-fourths of all present stock has been in store here for over five years. Of the remaining one-fourth, about two-thirds has been here over three years and about one-third more than one year.

To my question as to how much, approximately, the Government has lost in deteriorated stores and those rendered useless by becoming obsolete that could have been saved under the "purchase-as-needed system," he thinks it impossible to give even an approximate answer in money value to this question, but he thought perhaps 60 to 75 per cent. Certainly no stores could be lost under the "purchase-as-needed system," as none would be on hand a sufficient length of time to deteriorate or become obsolete. I believe it would be greatly to the interest of the Government were the storerooms of this depot used merely as exchange rooms for inspection, classification, and arrangement for shipment to posts of stores as they may be called for. * * * I think all the officers concerned are ready to agree with me that we can largely do away with the storage of supplies, which will add to the efficiency of the departments and at the same time reduce expenses materially.

This condition at the medical depots did not occur under the present administration of the Medical Department, and is being gradually adjusted.

Quartermaster's Department.

In his report of inspection of one of these depots Major Sanger says:

While the shipment of unserviceable supplies, or obsolete articles, to the depot from posts still continues, and is most distinctly an evil to be abolished entirely, the practice is not so general or frequent as a year ago, and will, no doubt, cease entirely as the views of the Secretary of War and the Quartermaster-General become better known and the detail of special inspectors to act on unserviceable property is discontinued. I again renew the suggestion that orders be issued from the War Department providing for the inspection, destruction, or sale of unserviceable property at the place where it may be found, and the sale or transfer to military posts of property which has been in use, but is no longer required;

and Colonel Vroom says:

In the examination of the unserviceable property submitted to me for inspection, my attention was called to the fact that unserviceable and obsolete property is frequently shipped to this depot from military posts only to be condemned and sold, or otherwise disposed of. For example, a quantity of old iron bunks was recently received from Fort Omaha, Nebr. These articles would no doubt have realized as much had they been sold at that place as they will here, and the cost of their transportation would have been saved to the Government. Four hundred and fifty-one old bunk bottoms were also received from Fort Omaha, which were sold at once, by order of the Quartermaster-General, and realized $4.50. The cost of their transportation from Omaha to St. Louis is, of course, a dead loss to the Government.

Major Moore says:

I found a large quantity of obsolete and valueless property on hand, such as large horse and mule shoes, tools, etc., which should be sold, as they will never be of any use in the service.

THE ARMY AND NAVY GENERAL HOSPITAL.

This institution was inspected September 26, 1896, by Lieut. Col. P. D. Vroom, inspector-general Middle district, and was found well administered in all respects. In referring to the treatment of patients Colonel Vroom says:

The commanding officer invites attention to the fact that many cases of rheumatism occurring in the fall and winter at Northern posts are kept too long at their posts, and a permanent recovery could be effected much sooner if they could be sent here as soon as they were able to travel.

WATERVLIET ARSENAL.

The following extracts from the report of the annual inspection of the Watervliet Arsenal, West Troy, N. Y., made by Col. R. P. Hughes, inspector-general North Atlantic district, may be of interest:

Plant and personnel.

The Government has set up a plant here at great cost, and the Ordnance Department has assembled a personnel that can not be surpassed in intelligence and skill in this specialty in the world. To allow a portion of the plant to lie idle and retain a highly paid corps of specialists only partially employed (which must be done for future work) adds a very perceptible percentage to the cost of work done. The field of forgings provided under appropriations made some years ago, which supplied the requirements of the factory when I last went over it, has now disappeared, as was then predicted, and no adequate supply has as yet been furnished to take its place. * * * Provisions seem to have been made by obtaining the very best machinery and tools, and by a careful, systematic organization of them for securing all possible economies in that direction, and all that now remains is that the necessary means be granted for drawing the best results from these provisions. * * *

Proving ground.

A complete system of electric illumination has also been put in, which is run by water power and is a marked economy.

There is only one item of expense in connection with this establishment for which it would seem advisable to make careful search for a rem-

edy. That is a proving ground for service trials. The proving ground at Sandy Hook, New Jersey, answers all the requirements for all tests, but after the test for type guns for endurance is once made it would seem possible to make service tests of new guns at some point that is more accessible and consequently less expensive in transportation.

NATIONAL CEMETERIES.

The reports indicate that an increase of space is needed at some of the national cemeteries and it would seem, too, that new ones are needed, as for instance in the vicinity of some of the branches of the National Home for Disabled Volunteer Soldiers which may not be so well organized or equipped to care for the dead as for the living.

Fifty-two, or about 62½ per cent of the entire number of national cemeteries have been inspected during the past fiscal year. The buildings and inclosures are generally reported in satisfactory condition, with a few exceptions where minor repairs are needed. How handsomely cared for many of them are has become proverbial. The inspector reiterates his recommendation, made in 1896, relative to the purchase of an additional plot of ground at Fort Leavenworth, Kans., as the present area is about filled. The lot in the Crown Hill Cemetery, at Indianapolis, Ind., known as the "national cemetery," is kept in order by the cemetery authorities. The inspector reports the lot now full and no more interments can be made therein, and recommends that steps be taken to secure an additional lot and make provisions for the care of the one now used. Among the list of cemeteries which are nearly full are mentioned twelve in Virginia, two in Maryland, and one each in the District of Columbia, New Jersey, Indiana, Pennsylvania, West Virginia, Alabama, North Carolina, and Florida.

The daily press has stated that there has been a recent disinterment of American dead at Chapultepec and the President of our sister Republic had them decorously reinterred. If so, it is not the first display of his constant courteous consideration.

We have a national cemetery in the city of Mexico, possibly inadequate; and attention was invited in a former report to the propriety of collecting such dead for as seemly care as has been shown some of those who have died for our country within its borders. The question is presented whether fairly equal care should be shown to all.

MILITARY COLLEGES.

The earliest instruction in military tactics at civil institutions of learning, now having an army officer detailed as professor of military science and tactics, as shown by the reports received for the past year, seems to have been given in St. John's College, at Annapolis, Md., in 1826. Within the next decade, or in 1834, the military feature was added to the curriculum at the Norwich University of Vermont, followed in 1839 by the establishment of a military department at the Virginia Military Institute, and in 1842 of the South Carolina Military Academy. These institutions were apparently the first among those now having army officers on duty with them to recognize the value of military training in connection with the regular curriculum in other branches of instruction.

With the outbreak of the civil war military affairs took a front rank, and during the dark and unsettled period from 1860 to 1866 military instruction was introduced into nine scientific institutions, one each in Alabama, Connecticut, Louisiana, Massachusetts, Missouri, New Jersey, and North Carolina, and two in Pennsylvania. But the Federal Government, feeling the lack of trained volunteer officers and desiring to guard against the recurrence of such an untoward situation, enacted a

law on July 2, 1862, which granted to each State then existing, and to each new State when admitted into the Union, 30,000 acres of public land, or scrip in lieu thereof, for each Senator and Representative to which the State was entitled in 1860 or at the time of its admission, for the purpose of endowing, supporting, and maintaining at least one college in each State, where the leading object should be "the teaching of agriculture and the mechanic arts, including military tactics." Under this act 10,230,000 acres of land or scrip was granted to the States. Subsequently the agricultural colleges which were benefited by this act were given further aid under the laws of March 2, 1887, and August 30, 1890, known as the Hatch Act and Morrill Act, respectively. The former granted an annual subsidy of $15,000 to each of these colleges for the maintenance of an "agricultural experiment station," and the latter $15,000, with an annual increase of $1,000 until the appropriation should be $25,000, for the more complete endowment and maintenance of these colleges for the benefit of agriculture and the mechanic arts. From the above sources the 42 agricultural colleges, to which army officers are now detailed, derived an income during the past year of $1,491,489, or an average of $35,511 each.

While the law of July 2, 1862, made instruction in military tactics compulsory on the colleges benefited by that act, the detail of army officers as military instructors was not legally authorized until after the close of the civil war, by the act of July 26, 1866, which marked the beginning of a system of military instruction, under the auspices of the Government, that has become popular and successful. Its growth may be partially indicated by the following résumé of some of the laws found necessary to meet the demands for officers, which has usually exceeded the supply:

Date of acts.	Purport.
July 28, 1866	Authorizes detail of 20 army officers.
May 14, 1870	Authorizes issue of arms and equipments.
July 15, 1870	Authorizes detail of retired officers.
July 5, 1876	Authorizes detail of 30 army officers.
May 4, 1880	Authorizes detail of retired officers.
July 5, 1884	Authorizes detail of 40 army officers.
September 26, 1888	Authorizes detail of 50 army and 10 navy officers.
January 13, 1891	Authorizes detail of 75 army and 10 navy officers.
November 3, 1893	Authorizes detail of 100 army and 10 navy officers.

In 1886 an inspection by officers of this department of the colleges having an army detail was ordered, and in 1887 the first inspections were made. It is worthy of note that during the ten years of inspection by the officers of this department the increase in military instructors from the Army over the original twenty has been three times greater than during the twenty years preceding the establishment of these inspections, and that the number of scholars under military instruction has about quadrupled in the past decade.

From time to time rules and regulations governing the detail of officers and the issue of arms and equipments, etc., were prescribed; those at present in force having been prescribed in General Orders, No. 93, Headquarters of the Army, December 27, 1893.

After creating such a professional duty, worthy of the most earnest efforts of our best officers, organizing it so that the highest results are assured, and uniting all in an harmonious and zealous effort to utilize the opportunities offered in the same liberal and patriotic spirit in which this widespread instruction in military science and tactics orig-

inated, all concerned can then rest satisfied that what can be so easily accomplished in these military departments at colleges must result in the benefit of the other departments, the welfare of the students, and the ultimate security and benefit of our people and their Government. The purpose for which such instruction was extended to every section of our country is sufficiently clear. It may be pointed to as an illustration of the higher statesmanship shown in legislation at a time when the highest was needed. The results can not be unimportant, and may prove as commendable in every respect as the legislation itself.

The military professors should be selected with all the care with which instructors to West Point are chosen, and given something of the same recognition, status, and duties. Out of the 102 officers who performed this duty during the year, 97 were detailed from the active list and 5 were retired officers, and under both classes some of the best successes were attained. Eighty-one were graduates of West Point, and 21 were not; and about 20 had graduated from the army service schools. Among the military professors there were 31 captains, 70 first lieutenants, and 1 second lieutenant, whose length of service was as follows: Fifty-three have twenty years or over to their credit; 20 had served between fifteen and twenty years, and 29 between ten and fifteen years. The scholarship, experience, and skill of many of the officers who have been detailed on this increasingly important duty is well known, and they have given ample practical evidence of what admirable professional work can be done in promoting a knowledge of military science, drill and discipline in our civil colleges. The marked interest of the Secretary of War in all that pertains to it is well known, and a period of improvement and success is looked forward to unexcelled by any in the past. There is but a limited opportunity given in our country for any military instruction and discipline, and all agree it should be worthy of it and as good as the circumstances will permit; and in case of any military emergency the graduates of these institutions should prove an important factor in our national defense and military organization.

Harmonious cooperation between the college authorities, the Government, the students, and the military professors is essential to success, and when firmly established the best results are assured—as where the military professors are members of the faculty in full standing; but if antipathy is entertained by some professors toward military instruction it is extremely difficult to make progress where it exists, whether covertly or openly.

Students.

The reports show that during the past year 39,394 students were matriculated in the institutions inspected, and 36,530, or 94 per cent, of this number were reported over 14 years of age. The number of matriculants per school averaged 390, against 383 for the previous year. Of this number, 18,416, or nearly one-half, enrolled in the military departments, and over 15,000 remained under military instruction during the year; but many institutions fell below this apparent average military strength for each school of 150 cadets. The greatest average in the military department was at the University of California, which had 605 students under milltary instruction. Girard College averaged 580, the University of Minnesota 450, Cornell University 464 during fall and 367 during spring, and the Ohio State University 305. All other institutions averaged less than 300, and of these 21 had between 200 and 300, 15 between 150 and 200, 16 between 100 and 150, 37 between 50 and 100, and 8 less than 50 under military instruction. The lowest average was at the Ohio Military Institute, which had 20 cadets. Some of the smaller schools appear to have done excellent work, though adequate numbers for proper military

instruction is of the first importance. At over half of the schools practically all of the students were enrolled in the military department; and it seems that the aid given by the Government in the dissemination of military knowledge is in keeping with our national policy for security and defense. The problem is to secure the best results.

There have been about 1,800 graduates of the military departments reported from the institutions, many of whom are fairly well prepared to assume the functions of officers of volunteers. If it were possible to follow the career of these young graduates, it would perhaps furnish good proof of the value of their military training, both to the country and to themselves. The reports show that the alumni of 27 institutions are represented in the commissioned force of the Army, and 31 are represented in the National Guard. Among those reporting their alumni in the Regular Army or National Guard may be mentioned Knox College, of Illinois; Michigan Military Academy; Bishop Seabury Mission, of Minnesota; Wentworth Military Academy, of Missouri; Bingham School, of North Carolina; Ohio Normal University; Pennsylvania Military College, South Carolina Military Academy, University of Tennessee, Agricultural College of Texas; Norwich University, of Vermont; Virginia Military Institute, and West Virginia University. One of the older of these institutions is said to have furnished from its alumni for the civil war 12 general officers, 25 colonels, 40 field officers, and 198 company officers.

The Army Register from year to year publishes the names of scores of the most proficient of these students. The thoroughness and scope of the instruction is incomparably superior to the early, uncertain, meager, and perfunctory efforts; and the present status deserves every proper recognition and development. How to advance and elevate the knowledge and discipline acquired at the few places that may yet be unsatisfactory deserves the most earnest attention.

College military organizations.

The infantry company is the unit of organization, and battalions and regiments have been organized where the number of companies is sufficient for that purpose. There are 4 institutions with regimental, 84 with battalion, and 13 with only company organizations. At Harvard University the instruction is confined to a higher theoretical course, embracing military history, law, and engineering, electricity in warfare, and kindred subjects, and there is no military organization; which is perhaps an anomaly under the law.

The following table exhibits the number of organizations and their strength reported at the close of the school year:

Institutions.	Organizations.			Strength.				
				Field and staff.		Line.		
	Regiments.	Battalions.	Companies.	Officers.	Noncommissioned officers and band.	Officers.	Noncommissioned officers and privates.	Total.
4	4	8	26	19	94	81	1,234	1,428
84	.....	84	262	199	858	771	9,733	11,561
13	.....	.....	13	8	11	44	504	567
101	4	92	301	226	963	896	11,471	13,556

This gives an average per school of nearly 3 companies, each consisting of 45 men, which may indicate how far some fall below the average. In addition, there are over 50 detachments, including artillery, signal,

bicycle, recruit, small boys, cavalry, saber, etc., which are formed for purposes of instruction and usually composed of members belonging to the regular infantry organizations. That these 13,000 or more military students are pretty fairly distributed in proportion to population throughout the whole country is indicated by 1,111 being west of the Rocky Mountains, 3,203 east of the Rocky Mountains but west of the Mississippi River, 2,360 north of the Ohio River and west of the Alleghany Mountains, 3,933 north of the Potomac and east of the Alleghany Mountains, and 2,949 in the remaining States from the Mississippi River to the Atlantic Ocean.

Discipline.

No military organization can exist without discipline; it is a concomitant to its efficiency, and the one may be measured by the other. The reports show that at 21 schools the discipline is purely military, and at the others, civil, or a mixture of the two. The best discipline is reported from those institutions where the cadet officers and noncommissioned officers assist in its maintenance or where the student body is domiciled in dormitories belonging to the institutions and constantly under military restraint; and the best military appearance seems secured where there are the most frequent formations, no matter for how short a time or unimportant purpose. Maj. J. P. Sanger reports:

> Except in those institutions where the upper classes and special students are exempted from drill, the attitude of the cadets toward the military department has been satisfactory, and in some instances all that could be expected. Their behavior has been good, and with but two exceptions, no flagrant breaches of discipline occurred.

At 30 institutions the cadets are required to march to meals, church, chapel, recitations, or other exercises. There are still a number of other schools at which students mess together and these marching formations could be adopted with advantage. Where once tried they have usually been permanent. Observance of such minor details indicate a well-regulated military institution, and give either special opportunities and zeal or favorable impressions and illustration of a methodical system and orderly conduct. There may be institutions at which this practice is not feasible.

Uniforms.

Uniforms have long been accepted as an essential requisite of military organizations, and without them there seems to be lack of coherence, stability and true soldierly spirit. In our educational institutions, where the coming and going of students can not well be controlled, the anomalous condition of having partially uniformed cadets, or even cadets without uniforms, in their military organizations prevails to some extent. About 4 per cent of the cadets in the military departments belong to this class, but an improvement is noted over the conditions of the previous year as shown by the following table:

Years.	Cadets without uniforms.			Cadets partially uniformed.			Total cadets.	Per cent of cadets enrolled.
	Number.	Institution.	Average per institution.	Number.	Institution.	Average per institution.		
1896	651	39	16	331	9	37	982	5.1
1897	467	36	13	174	17	10	641	3.5

Maj. F. Moore reports:

> Another essential is that all cadets should have a uniform for drill and military duty. The excuse at institutions where all the cadets were not in uniform was the

poverty of the students; but as a uniform is as cheap and usually better than the ordinary civilian dress used by students, I can see no reason why there should be any without uniform. Of course it would be still better if the cadet were required to wear his uniform at all times, but it is doubtful if we have as yet progressed that far.

Of course the cost is a consideration with the poorer class of students, who find it difficult to add a uniform to the civilian garments they already possess and whose stay at the school is uncertain or dependent upon their success in working their way through college. But a uniform of some kind is essential to successful military drill, and any aid that can be given by the National or State Governments, or even by the colleges themselves, to such deserving students as desire to profit by the military instruction, would be well bestowed. At four institutions, the State Agricultural College of Kansas, the University of the State of Missouri, the Girard College of Philadelphia, and the South Carolina Military Academy, all the cadets receive their uniforms free, and at the Agricultural College of South Dakota, nearly all, and at a few others, a limited number of students, are given this advantage. At 30 per cent of the institutions the uniform is practically worn at all times and these cadets seem to excite specially favorable comment as to their appearance, discipline, respect, and courtesy, though some others may equal them.

College arms and equipments.

The reports show that under the provisions of General Orders, No. 93, Headquarters of the Army, 1893, regulating the issue of arms and equipments for military instruction and practice, 66 schools have been supplied with field pieces, 100 with Springfield cadet rifles and accouterments, 2 with carbines, 1 with revolvers, and 53 with sabers or swords. These issues comprise forty 3.2-inch B. L., eighty-eight 3-inch M. L., and two 6-pounder field pieces, 16,121 Springfield rifles and sets of accouterments, 65 carbines, 10 revolvers, and 1,465 sabers or swords, representing a value of over $350,000. Nine of the old pattern 3-inch wrought-iron muzzle loaders, 165 Springfield rifles, and 7 swords were reported in unserviceable condition. Signal equipments have been issued to 51 institutions, consisting principally of a supply of practice kits and 48 heliographs, all in serviceable condition, except 2 heliographs and 6 signal staffs.

The field pieces seem fairly well protected from the weather and are reported housed or covered by paulins when not in use. About two-thirds of the schools have an armorer, who is usually one of the students or the janitor. Some of the colleges have happily employed a man for this purpose, who has seen military service and understands the care of arms The value represented by the Government property would seem to justify the detail or employment of an enlisted man, retired or otherwise, to act as armorer and assist the military professor. In all instruction of our citizen soldiery the presence of a trained soldier has been found most beneficial. The care and protection of the public property at these schools, in many cases, needs better attention than has been shown in the past. There are almost as many students at these colleges as there are soldiers in the Regular Army, and the rights of the Government as well as the individual deserve to be carefully guarded. Maj. J. P. Sanger reports:

As a rule the cadets are responsible for their arms and accouterments, in respect to the issuing of which there has been some improvement during the year. I suggest that the professors of military science and tactics be instructed to give this subject personal attention, with a view to protecting the college against losses. * * * The system of individual responsibility in respect to issues, prevailing in the Army should be carried out at the colleges, and for this the army officer should

be held responsible. The college protects the Government against loss by giving bond, and the military professor should protect the college. Any officer should be able to devise a way to do this even if he had not learned the army method in his company.

Military exercises.

Some colleges have held encampments and practice marches during five years, by which nearly 15,000 students have obtained the first essential knowledge of soldierly and camp life, and in several instances colleges have united for the purpose of such fundamental tactical instruction.

The following table exhibits some of the exercises held at these institutions:

Military exercises.	Number of institutions at which held.
Infantry drills:	
In close and extended order	93
In close order only	8
Competitive drills:	
Between companies	59
Between individuals	60
Intercollegiate	3
Signal practice	62
Dress parades	80
Street parades	61
Guards:	
Mounted and maintained	38
Mounted for instruction	13
Officer of day detailed	61
Encampments	16
Practice marches (longest in one day, cavalry 36 miles, infantry 15 miles)	23
Problems in minor tactics	43
Target practice	53
Position and aiming drills	52
Gallery practice	26

Some of the inspectors have required the solution of simple problems at their inspections, as they do at those of the army garrisons. The results have been encouraging.

Maj. E. A. Garlington reports:

There has been some advance in the character of this instruction. Of the 18 institutions inspected, at 11 the cadets were fairly well prepared to go through some of the simple exercises, such as the formation of a small advance guard, the establishment of a line of outposts, and the attack of an imaginary enemy. These maneuvers were necessarily crude, and frequently, owing to contracted space, only the formation was attempted; but, where the ground permitted, the prescribed methods were followed through the various stages sufficiently to illustrate, to some extent at least, the principles involved.

Small-arms target practice has improved during the year, and it is hoped that another year may show still further improvement, though at a great number of schools this practice is not possible on account of lack of facilities or opportunities. Considerable interest and enthusiasm were manifested in the intercollegiate rifle contest held last spring. The following circular letter, sent from the military department of the University of Illinois to each institution having an army detail, explains the scheme:

UNIVERSITY OF ILLINOIS, MILITARY DEPARTMENT,
Champaign, Ill., ——— ——, *189—*.

To the ADJUTANT,
———— ————,
————.

SIR: With a view to stimulating an interest in military rifle shooting among students attending institutions having military instruction, it has been suggested that the cadets of all such institutions in the country engage in an annual rifle contest, the result of such contest to determine for the year the relative standing in

marksmanship of the various schools participating. (See article in Army and Navy Journal, May 23.) Therefore, at the request of the officer in charge of the military department of this university, I wish to suggest a contest, to be held as follows:

(1) Every competing school to be represented by a team composed of 10 men, each man to have been a member of the battalion which he represents throughout the whole of the current school year.

(2) Each team to shoot on its own grounds.

(3) Each team to shoot on the same day, the date to be decided upon later, but to be as late in the spring of 1897 as possible.

(4) Each team to shoot 100 rounds—10 rounds per man—at 200 yards, according to small-arms firing regulations governing rifle contests in United States Army.

(5) The rifle used to be the Springfield rifle issued by the Government to the institution.

(6) The president of each institution, or officer in charge of military department of same, to select an entirely disinterested person, who shall be present at the range during the contest. He shall send a telegraphic report of the total scores made by the team whose shooting he witnessed, to such staff officer, United States Army, as shall be selected. He shall also mail score sheets to that officer, and shall certify that he witnessed the entire contest, and that it was conducted strictly in accordance with above-mentioned regulations. The officer receiving these scores will report the records made to the daily press. The adjutant, or other competent officer of each battalion, to forward by mail a copy of score record to each competing school.

The above plan, with the exception of a few changes made necessary by increased number of participants, was tried last year in contest between the teams of the University of California (Berkeley) and University of Illinois. The contest was a decided success, both as to the working of the plan above outlined and as regards beneficial effect upon this battalion.

Very respectfully, yours,

A. ST. J. WILLIAMSON,
Captain Company B, University of Illinois Battalion.

Address replies to Daniel H. Brush, Captain Seventeenth Infantry, U. S. A., Champaign, Ill.

The plan, with few modifications, was practically carried out as above outlined, Lieut. H. S. Hale, inspector of small-arms practice, Department of the Missouri, consented to receive and report the scores made by the competing teams; and about 25 colleges responded and took part in the contest.

Such competitions necessarily increase the interest in the military departments, create a healthy rivalry among the students, and are an important factor in improving the efficiency of the cadet soldiery.

It would seem that the importance of small-arms practice might be still further enhanced by the issue of one of the Krag-Jorgensen rifles for the purpose of instruction and practice at these exercises. Familiarity with the arms used under actual conditions is essential. And the old-time muzzle-loader field pieces could with equal propriety be replaced by the modern breech loaders, where instruction in artillery drill is desirable. There has been no pistol practice, nor artillery target practice except with the machine guns; but the cadets at 12 schools have been exercised in firing blank cartridges.

Books and records.

The remarks of Maj. J. P. Sanger on the subject of a uniform system of military books and records for these college organizations seem to cover the ground thoroughly and deserve due consideration in any attempt to increase their efficiency. He says:

"For the proper instruction of the cadets in accounting for the personnel and material of a company, it is indispensable that they have some practical familiarity with the usual records, and therefore the ordinary record books, returns, and reports should be prepared by them a sufficient number of times to enable them to understand them. Every company should have a morning report, which should be made out invariably on drill days, and show accurately the status of the company. When there is more than one company, the morning reports should be consolidated in the adjutant's office.

"An order book, letter book, roster, and record of Government stores issued to each cadet would complete the list of books. Each member of the graduating class should be required to make a return of the company from time to time and prepare muster rolls, and the captain should muster his company in proper form. They should also be required to prepare a ration return occasionally, and have explained to them the method of arming and paying soldiers and the system of property accountability prevailing.

"The records of each battalion should correspond in part to our post records, and when there is a cadet major he should be required to supervise their preparation by the battalion staff. Too little attention has been paid to this subject in our Army, and throughout the war the greatest neglect prevailed. As a result we will never have accurate data upon which to make estimates or base conclusions. The histories of companies and regiments, as compiled, even in the Regular Army, have been to some extent a matter of guesswork, while a correct history of many volunteer organizations has been usually impossible.

"That a cadet should be able to say after being under the military instruction of a Regular Army officer four years that he never saw a morning report book seems incredible, but there is indisputable evidence that such is the case. 'Military science, strategy, and the organization of armies' have usually been taught to cadets having no knowlege of the ordinary method of accounting for the men of a company. I claim that to the ordinary company officer, a correct knowledge of the duties devolving on him is of far greater importance than vague speculations in the domain of strategy, or any other branch of military science whatever. But the character of this report and its purpose forbid a more extended criticism of this subject. An effort has been made to present plainly such a view of the colleges inspected by me as will enable the authorities to remedy existing defects. It is evident to me that too much latitude has been given the colleges and too much left to the discretion of the Army officers detailed to them, and that new regulations, based on our more recent experience, would do much to bring about a uniform system of discipline and instruction, far better adapted to the needs of the military service than the curriculum of the average colleges."

Remarks.

Generally, the officers seem to have done as well as can be reasonably expected, under existing regulations and with the limited time at their disposal, and a large number of the students have shown commendable zeal and aptitude in this instruction. Perhaps if the course were made progressive from class to class, like the study of other branches of science, from the mere recitation in drill books as tactics in the preparatory course, to the highest instruction practicable, an ideal system might be perfected. It would of course be necessary to prescribe a uniform system of instruction within certain limits for each class of schools, and the indiscriminate selection of text-books, referred to in last year's report, would thus be avoided.

At 86 schools the military professors gave lectures, some of them elaborate and illustrated, requiring considerable pains for preparation, and some merely informal and offhand. At one school they were given by the military professor to the students at large by special request; and at several, lectures were also given by other military men. At 21 colleges, essays were prepared by the cadets, and at 18, campaigns were studied. But it is the quality of the work done and not the quantity that reflects the most credit; and the results accomplished during the past year contrast most favorably with that of a decade ago; and the gradual and almost imperceptibly steady improvements that have been wrought from year to year stand depicted in bold relief; and it is believed a more general proficiency among a much larger number of college students is entirely practicable.

The law which laid the foundation for this widespread military instruction, so intensely needed under our national circumstances and by our political and commercial interests, originated from the want of officers, which was severely felt during our civil war, and its enactment was evidently intended to meet future contingencies. The primary object, therefore, in fostering military instruction at these educational institu-

tions should be the preparation of student cadets to assume the duties of officers. These young gentlemen can not expect to learn how to command before they have acquired the art of obeying intelligently, properly, and promptly. The reports show what has been accomplished and what still needs to be done—and should be done now—to meet the spirit of the law. It is the indisputable right of the Government to prescribe the scope and nature of military education and to demand compliance with the conditions and regulations connected with the detail of an Army officer, and it is the duty of the college authorities in accepting the detail to comply with all the conditions imposed. On the one hand, we have schools that have been munificiently endowed by the Government as a condition of military instruction, and are lawfully required to instruct in military tactics; on the other, schools that have agreed to military instruction by accepting the services of an Army officer, and both are equally bound in good faith to make the instruction efficient. And the Government and its officials are equally bound to aid and promote this efficiency.

Much has been accomplished, and more could be, under a uniform and more progressive system and methods. Much that has been done seems to have been done well; and many of the college cadets who annually leave these institutions, well instructed in military tactics and imbued with a military and patriotic spirit, are well entitled to be relied upon by their country in case of any emergency and have a claim upon the Government which can be wisely recognized in an appropriate way by such legislation as will subserve the best interests of the Government, and stimulate and elevate military instruction in our civil colleges, and produce the highest results possible under the laws under which such military instruction was established; even, if necessary, providing for the appointment to the Army of a proper number of college cadets, and, if it should be found to produce the results anticipated, also insure the accessibility and proper employment of the whole body of graduated and qualified college cadets in time of war.

Perhaps an apt illustration of the broad ground properly occupied by the inspection service is given by its touch with the personnel, extending from the students in these institutions to the disabled volunteers of the civil war, and the conscientious effort toward improvement in each and all is constant and effective.

INSPECTION SERVICE.

The work performed during the year, and the results obtained by the limited corps of inspectors in accomplishing all that was assigned, are commendable. Their labors embrace every phase of military affairs whether pertaining to line or staff, and considerate attention is respectfully invited to them. The value of their work depends mainly on the thoroughness and judgment with which it is done, and it is sincerely hoped that it is accepted as satisfactory, though they have been obliged to travel by night and work by day regardless of personal comfort, and to utilize every opportunity in the preparation of their reports in order to render them in reasonable time. They seem to have more than their share to do, and some relief from the constant strain and restless exertion necessary to keep their work up to date seems due them. Previous to 1895, six officers were attached to the inspection department, and the necessity of a larger personnel was repeatedly submitted. Now but one officer is attached and a proportionate increase in the duties has thus been thrown upon the officers of the corps. The following comparative table shows some of the stated work assigned to the six officers

of this department in 1893 and during the past year, indicating an increase of over 50 per cent in their work:

Nature of duties.	Total inspections.		Average per officer.	
	1893.	1897.	1893.	1897.
Disbursements	440	704	77.33	117.33
Military posts	34	64	5.67	10.67
Armories, depots, etc	61	57	10.17	9.50
Military colleges	50	64	8.33	10.67
National cemeteries	37	51	6.17	8.50
Recruiting rendezvous and stations	15	29	2.50	4.83
Property (sets of I. and I.)	648	1,006	108.00	107.67
Total	1,285	1,975	214.17	329.17

It is, of course, impossible to sum up all the work done in figures and tables, but the exhibit is sufficient to illustrate the largely-increased demands and the necessity of a larger force, if we desire to maintain thoroughness and efficiency without excessive or unjust exertions. Whether it is to the best interests of the service to increase the personnel of the corps for this purpose, or to take other officers from their legitimate duties and attach them temporarily, is not difficult to determine in this age of specialties. It is but fair, too, to invite attention to the intelligent, zealous, and effective work of the civilian force of the Department, which, under certain discouraging circumstances, have done so much toward increasing efficiency and economy in the public service.

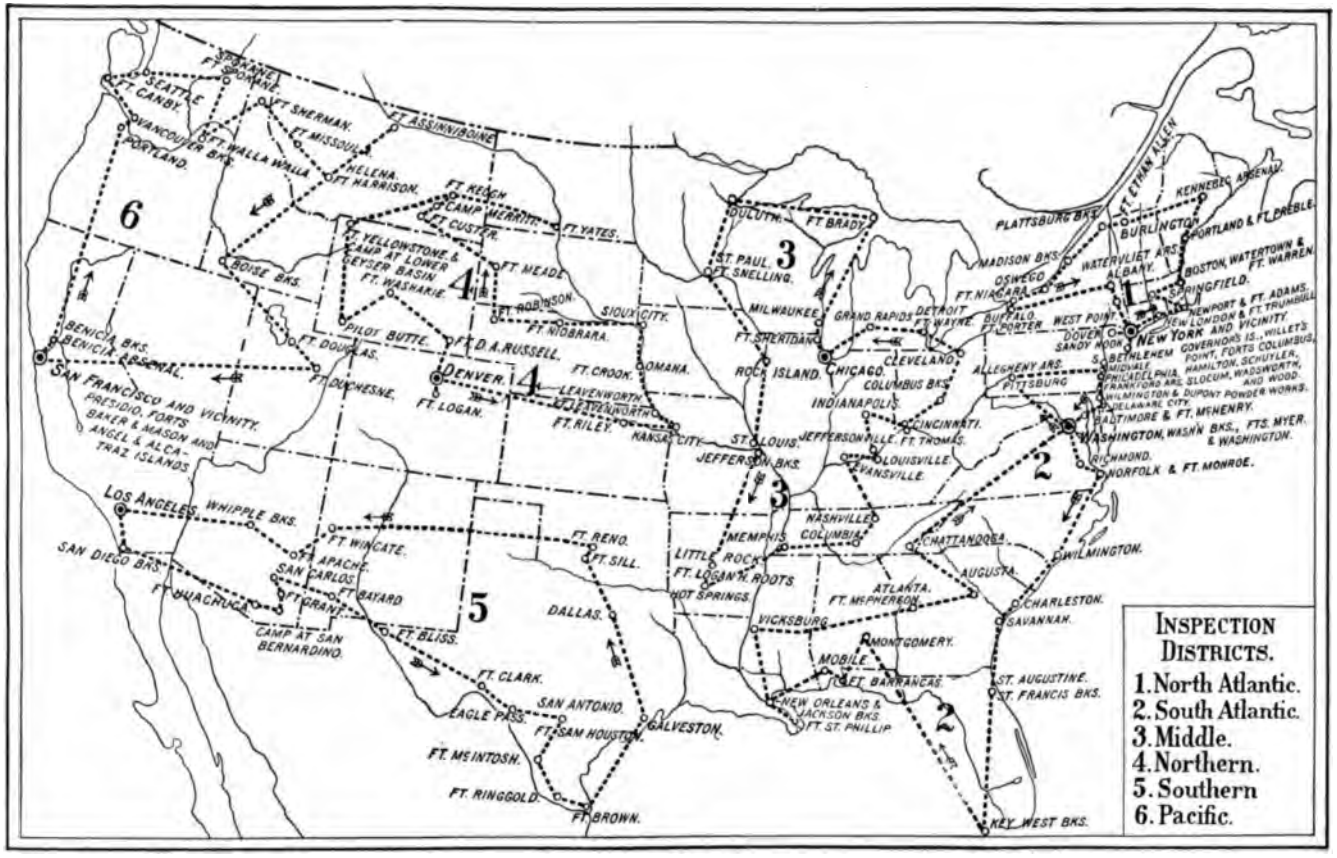
The orders of April 5, 1895, prescribing the stated inspections of this department and bringing the troops into more immediate and personal touch with their commanders, were, in a measure, intended to offset the reduction in the commissioned force by bringing the inspection service directly under the control of the War Department and General Commanding the Army, and to a very limited extent this was accomplished; but the orders were mandatory in character and left too little discretion to the judgment of the inspector. To remedy existing defects and effect a more equable distribution of work for the several districts, new orders were recently issued. The inspections assigned each district under these orders are shown in Appendix B, and the inspectors are required to make three periodical tours of inspection each year to such of the places as the Inspector-General of the Army may indicate and also to inspect such ungarrisoned posts and national cemeteries as are along the route of travel once in two years. They are also authorized to confer with department commanders whenever it may be necessary, before and after the annual tours of inspection, who, it is hoped, will make the fullest use of the services of these officers during their tours. The department commanders are also authorized to inspect each post annually, accompanied by whichever staff officer they deem best for the public service. The improvement effected by this double system of inspection, one by the commanders and the other by the branch of the general staff whose special duty it is under our army organization, is perhaps already evident, and sufficient for the present. It appears to be the system approved and established by General Washington, Steuben, and Alexander Hamilton, and which has existed satisfactorily throughout the greater part of our military history.

Respectfully submitted.

J. C. BRECKINRIDGE,
Inspector-General.

The SECRETARY OF WAR.

MAP SHOWING LOCATION OF MILITARY POSTS, ARMORIES, ARSENALS, DEPOTS, RECRUITING STATIONS, ETC., AND STATIONS OF DISBURSING OFFICERS OF THE ARMY



would be done as far as conditions would permit. I also noticed that considerable interest was taken by people residing near the colleges, who turned out in large numbers to see the inspection; this, of course, tends to encourage the military department."

A copy of the inspection report of each institution has been furnished its president under the requirements of General Orders, No. 93, Headquarters of the Army, 1893. These reports are frequently consulted by military professors and others interested in this work and contain many useful suggestions and serve as a guide to better success, and would furnish much-needed information that more than one battalion among these 12,000 students should find useful or interesting.

Military professors.

During the past year no change in the officers at 78 institutions was made; at the remaining 24, new officers were detailed, and this seems to be about the normal annual change. It is quite evident that with judicious management and complete and accurate knowledge a selection and assignment of the best officers to the best colleges will produce the best results. Maj. J. P. Sanger reports:

"There is no doubt some difference in the aptitude of the several officers for this duty, as well as in their personal influence with the college authorities and students, resulting from the personality of the officer. The main obstacle to success lies in the attitude of the college authorities and their liberality toward the military department."

While suggesting that General Orders. No. 93 of 1893, be modified, he says:

"Similarly, at many other colleges, officers are used as school-teachers and accomplish but little in behalf of the War Department. In short, their civil duties are paramount, and 'military tactics' which they are alone authorized by law to teach, receive secondhand consideration. This is natural, and results from the situation. Proper military instruction is impossible at these institutions for lack of numbers. Under the present system of college details, officers may apply for college duty, and colleges are permitted to apply for officers by name. The agreement to teach in the academic branch and the remuneration to be paid, are always arranged in advance, and in many instances constitute the sole reason for the application on the part of the college and the sole object of the officer in accepting the detail.

"How can there be military efficiency under such a system, and who can tell how far-reaching the lack of discipline and instruction may be?

"Officers should be detailed on account of their fitness alone, and should be imbued with the desire to make efficiency in 'military tactics' the test of their abilities as soldiers, and not their knowledge of mathematics or law.

"2. When details are changed both officers should be present at the institution, and the old officer should be required to turn over to the new, receiving a memorandum receipt therefor to be forwarded to the War Department, all the property of the United States for which the college is responsible, together with the books and records of the Department.

"The relieving officer should arrive, when practicable, before the last parade of the cadets, and should accompany the old officer in a formal inspection of the cadets. Of this inspection a report should be made to the Inspector-General of the Army by each officer.

"The new officer should also receive from the old such information concerning the military department as the experience of the previous four years had developed, and should not begin his tour, as many do, with no knowledge of the situation and no experience to guide him.

"As has been suggested by Colonel Vroom, before making an original detail to a college, the inspector-general or acting inspector-general of the inspection district in which the college is located, should visit the college and confer with the president, to whom he should explain the requirements of the orders and the expectations of the War Department that all undergraduates, not physically incapacitated, will procure uniforms and take the course of military instruction, and that proficiency in the prescribed course of the military department will be as much as proficiency in any other course a condition of graduation and of a diploma. Both these points should be insisted on, and should be incorporated in any subsequent orders which may be issued, more particularly the latter.

"When a college furnishes cadets enough to enable the professor of military science and tactics to form an infantry battalion of not less than four good-sized companies, the question of exemption may be considered, and not before, but on all accounts proficiency in the course of instruction should be insisted on as a condition of graduation.

"Of 104 colleges inspected last year, but 56 had adopted this rule so indispensable in the average college, to attendance, and consequently to instruction. As long as college cadets know that their standing in their classes and the certainty of a diploma are not affected by their record in the military department, they will do very much as they please. In the best managed colleges proficiency in the military department is a requirement, and should be in all.

"Having concluded his interview, the inspector should make a written report of the views of the president or other college authorities as to the status to be given the military department, the probable number and obligations of the cadets, the facilities for instruction and for the care of Government property. On the character of this report the detail may be made or withheld."

Lieut. Col. P. D. Vroom reports:

"Some progress has undoubtedly been made in military instruction in colleges during the last few years, but the whole system could, in my opinion, be materially improved. * * * I believe the law should be so amended as to further require the institution to have not less than one hundred male students capable of bearing arms habitually in attendance. The law should further provide that no officer shall be detailed to college duty who has not had at least ten years' service in the Army."

Capt. George B. Walker, Sixth United States Infantry, who inspected three colleges, says:

"It appears to me proper that no officer should be detailed to a college until such institution has formally agreed to certain conditions, which, if not carried out by the end of the first year, should cause the discontinuance of the military department at that institution. Some such conditions might be the following: (1) An effective support of the military instructor by the faculty in matters of discipline. (2) Every cadet should appear in complete uniform for military duty. (3) * * * (4) Cadet chevrons should be worn to indicate all ranks. (5) A flag should be hoisted at all times during daylight.

"In looking for proper stations for military instructors, probably the following would furnish the most fruitful field: (1) State universities or agricultural colleges. (2) Highly endowed pay schools, such as the Cathedral School of New York. Sectarian schools are too often dependent on tuition fees to have the power to properly support the military instructor. (3) Private military schools." * * *

The regulations governing the detail of officers, prescribed by the Secretary of War, permit military professors to perform also other duties than those pertaining to military instruction, and receive compensation therefor. The reports show that at 56 institutions they utilized their spare time with profit to themselves and the colleges, and at 48 they received extra compensation, ranging from $100 to $1,200 per annum. In 13 cases there was no compensation for the extra labor, and in 5 cases there was no additional labor for the extra compensation. At 12 institutions they were also provided with quarters in addition to the compensation, and at 7 they received quarters without additional compensation. The extra duties performed by them included instruction in mathematics, languages, law, history, and other branches of science as well as disciplinary surpervision, serving on committees, inspection of quarters, etc. At one institution the military professor reports that he instructed a class of militia officers in the neighboring city.

Band.

At 58 schools bands or drum corps have been organized, which are usually supported by the institution, supplemented in many instances by voluntary contributions and subscriptions. The provisions for the band seem to be liberal at some schools, where the members are paid a regular salary, or allowed their tuition fees, or uniformed and equipped free of charge. A well-conducted band is an important adjunct to a military organization. One of the military professors, who raised a band during the past year by subscription, reports that it adds more than anything else to his department, as he is now enabled to have ceremonies to relieve the monotony of drill.

Flag display.

The national flag is displayed at 75 institutions from a flagstaff on the grounds or from one of the academic buildings, but there seems to be no uniform rule for its display. At 51 institutions it is ordinarily displayed from morning until evening with some variations, and at 24 it flies only on special occasions. The display of the national flag at institutions where an officer of the Army is the instructor seems most proper, and it has been suggested that this requirement be made one of the conditions for the detail of an army officer. It is also suggested that the flag be raised and lowered and saluted daily, and at all times as prescribed in the Army regulations. At 81 institutions the military organizations carry the national colors; 18 also the State, school, regimental or battalion flag; at 7 institutions a flag is carried, but it is not national, and at 14 no flag is carried.

Legal recognition.

At the following institutions located in as many States, the military organizations have been made a part of the National Guard of the State, or given at least a legal existence under the State laws: State Agricultural College of Colorado, Northern Illinois Normal School, Agricultural and Mechanical College of the State of Mississippi, University of the State of Missouri, Bingham School of North Carolina, South Carolina Military Academy, Agricultural College of South Dakota, Norwich University of Vermont, Virginia Military Institute, and West Virginia University. This is an increase of three over the number reported in 1895. Maj. J. P. Sanger reports on this subject:

"It would seem that the college battalions should be organized under the laws of

the States in which they are located, and form part of the State military force, just as the Corps of Cadets, West Point, is a part of the Regular Army. Otherwise they are anomalies of military organization, recognizing no military authority, State or National. No military organization whatever should be permitted in this country, in peace or war, except by authority of law, and our colleges and universities should recognize and teach this principle. Again, no better plan of raising the standard of discipline and instruction in college battalions has suggested itself to me than by incorporating them in the National Guards of the States, and to a qualified extent bringing them under the laws of the State.

"The officers should be commissioned by the governors of the States, and for certain offenses the cadets should be amenable to trial by court-martial, as is now the case at several institutions. The cadets would not necessarily be called on for military duty, save in great emergencies, but be given all available time for their academic work. As a certain result, they would come in time to provide the States with well-instructed, well-disciplined young officers and noncommissioned officers competent in all respects to serve in the National Guard or volunteers, and this would seem to be their legitimate purpose."

This seems specially applicable to State institutions, many of which already receive substantial aid from their State government for their military department, such as funds for various purposes, loan of tents, arms, and equipments, use of armory, etc. The State of Rhode Island, for instance, appropriated $45,000 for a drill hall and a recitation hall at the College of Agriculture and Mechanic Arts at Kingston; South Carolina $20,000 for the maintenance of 68 beneficiary State cadets at the South Carolina Military Academy; Virginia $30,000, part of which for the maintenance of 50 State cadets at the Virginia Military Institute; Missouri $5,000 for clothing for its State University, and other States are on record as rendering substantial aid to these schools.

Military course.

The orders of 1893 prescribed the course of instruction and the minimum number of hours to be devoted thereto, which, for theoretical instruction, must be at least one hour per week, and for practical, at least two hours. The former shall be by recitations and lectures including, as far as practicable, a systematic and progressive course in the drill regulations, preparation of the usual reports and returns pertaining to a company, the organization and administration of the United States Army, and the elementary principles governing the art of war. Surely less than this could hardly be accepted as the main work of a professional soldier under full pay and assignment to duty under regular orders. The practical course embraces small-arms target practice and, as far as possible, all the movements prescribed by the Drill Regulations applicable to a battalion; artillery instruction pertaining to the formation of detachments, manual of the piece, mechanical maneuvers, aiming drill, saber exercises and target practice; instruction in the duty of sentinels and, where practicable, castrametation. In the practical course especially the best results are usually obtained where all the classes are in the military department and where a systematic and progressive course is possible; but where only one class is under instruction, compelling the military professor to begin each year anew with a new set of students, the reverse conditions obtain.

The following scheme of instruction is suggested by Maj. E. A. Garlington as applicable to the average institution having 100 cadets or more:

PRACTICAL COURSE.

All classes:
- Infantry Drill Regulations—
  - School of the Soldier, Company, and Battalion.
  - Extended order to include the battalion.
  - Advance guard, rear guard, outpost.
  - Ceremonies applicable to the organization.
  - Camps and marches.
- Small-arms target practice.
- Guard duty—
  - Manual of Guard Duty, A. G. O., 1893.
- Minor Tactics—
  - Solution of elementary problems suited to the locality and organization.

Senior or first class:
- Preparation of returns and reports pertaining to a company.

Junior or second class:
- Artillery Drill Regulations—
  - Nomenclature of piece and carriage.
  - School of the Cannoneer.
  - Exercises for two or more gun detachments dismounted.

Sophomore or third class:
- Signal drill—
  - Signaling with flag and heliograph—Army code.

THEORETICAL COURSE.

Senior and junior, or first and second classes:
Infantry Drill Regulations.
Manual of Guard Duty.
Senior or first class:
Minor Tactics—
Wagner's Catechism.
Outposts, advance and rear guards.
Army Regulations.
Lectures—
A short course to amplify and explain above scheme.
Army organization (United States) and administration.
Militia of State where institution is located.
Volunteer forces and their relation to the United States.
Significance of military instruction in civil institutions.
Junior or second class:
Artillery Drill Regulations—
School of Cannoneer.
Exercises for two or more gun detachments dismounted.
Theory and use of sights. (Artillery circular No. 1 of 1893.)

He says that:

"In some cases the president and some of the faculty favor the department, while other members oppose it, sometimes overtly, but usually indirectly. I think I am safe in saying that the case is rare when anyone in authority favors the department as a means of educating young men in military science and tactics with a view to graduating them sufficiently well trained to be of value as officers of volunteers in case the country should need them."

To make any course successful, the hearty cooperation of the college authorities is necessary. There are now about 17 schools at which it appears military instruction is not fully encouraged by the college authorities, or where it is merely permitted to comply with the law.

And it may indicate the favorable conditions and progress during the past year that at 92 schools the military department and instruction is regularly prescribed, catalogued, and published; at 57, proficiency in the military department is necessary for a diploma, and at several a separate military diploma or certificate is given. At 66, medals, prizes, and other inducements are offered for excellence in military work, and the Army Register publishes annually the names of the graduates from each college who have shown the greatest proficiency in military work. Credit is also given in class standing at 56 schools for theoretical military studies, and at 41 for practical military work. But there seems to be still much room for improvement, as shown by the report of Maj. F. Moore, who says:

"There are seven of these institutions where no credit is given for instruction in the military department, and at others various values are given. It will only be thoroughly learned and popular when students are required to be proficient in the department before they can graduate, and credit is given them for their work the same as in any other branch taught."

It has been suggested in previous reports, and is again submitted for consideration, that a board, composed of officers who have had experience with the matter of military instruction at these institutions, be convened for the purpose of devising a scheme of instruction elastic enough to be applicable to all classes of civil schools and at the same time insure the greatest uniformity practicable. Maj. J. P. Sanger reports:

"Some modification of this course of instruction and of the time to be given it, as prescribed in General Orders No. 93 of 1893, is most essential. Nor should the course be the same for all institutions. A college like the Virginia Military Institute, or South Carolina Military Academy, or Pennsylvania or Michigan military academies, which aspire to the reputations of first-class military schools, should certainly have a more extended course of instruction than a purely classical school with a military annex.

"But the minimum course in any college should be sufficient to compensate the Government for the services of the officer, and insure well-trained officers and noncommissioned officers of infantry."

Perhaps the best plan might be to classify these institutions, and grade those of each class to uniform methods. On this subject Capt. E. Swift reports:

"From my observation of these and other schools, I am of opinion that they should be classified as follows:

"1. Schools where students appear in uniform at all times and are constantly under military discipline.

"2. Colleges which receive assistance from the Government and are required by

law to maintain a military department, where the students are under military supervision for about three hours per week.

"3. Colleges, private institutions, and the like, receiving no aid from the Government and very little from other sources, in which the students are under the same military supervision as in the second class.

"4. Public schools which have not yet been recognized by a detail of an officer.

"It is my opinion that the detail of an officer to an institution of the first class is only justified when the number of students able to bear arms is 100 at least and where facilities for instruction are ample in all respects. At an institution of the second class the authorities should be required to furnish ample facilities for the instruction of at least 150 students. It should be insisted that this number will be available, and that attendance will be compulsory for more than three hours in a week. It is observed that the minimum requirements of the War Department are not faithfully complied with in many cases, although the acceptance of the services of an officer of the Army ought to be a tacit agreement to those conditions. In some cases students are excused on pretexts that should not be admitted; the theoretical course is sometimes voluntary, sometimes only obligatory on the cadet officers, and often the entire course is voluntary.

"Institutions of the third class above mentioned are often unable, even if they wish, to give proper standing and dignity to the military department. They sometimes use the military department as an advertisement, do not fulfill what they promise, and thus the officer is placed in an anomalous and embarrassing position. Such an institution should not be recognized. It appears to me that the employment of an excellent officer at some place with a little company of poorly uniformed and instructed students is ridiculous, and tends to belittle the officer in the eyes of the people at large. Better employment would not be hard to find.

"The law which styles these officers as professors of 'military science and tactics' should be changed. An examination of the course pursued at our most famous schools might leave some doubts in the professional mind if even yet they have succeeded in perfecting a course of that description. The course at these schools must be elementary, and the so-called theoretical course appears to be largely taken up with a study of the drill book. Of all the courses taught at most of these institutions the military has the least time given to it and the military certificate or diploma is the most cheaply obtained. It must give the people of these places—faculty as well as students—a mean and erroneous idea of our profession to find that there is so little in a course of 'military science and tactics.' The opposite impression must have been intended by Congress in authorizing these details.

"Much of the difficulty is due to the lack of a uniform system. If the more modest title of 'military training' were accepted in place of 'military science and tactics,' and if a uniform system of lectures and recitations were prescribed for all it would improve the service. The lectures need not be elaborate—some of them should be no more than careful discussions of portions of the drill book. It might be well to require that copies of all lectures be submitted to the Inspector-General.

"More time should be insisted on for the military department of institutions, which now give two hours in a week for drill and one hour for theoretical work. Two hours in a week is not sufficient for proper practical instructions in drill, target practice, marching, and guard duty. As a consequence those who are strong in one direction will be weak in another—according to the branch that they have practiced most. It should be understood that a fair proficiency in a few drill movements is not all that is required in the practical course. A higher standard should also be set for the theoretical course."

Maj. E. A. Garlington, who inspected 18 schools located in the South Atlantic district, classified them as follows:

1. National institutions receiving an income from the United States.
2. State institutions receiving an income from the State.
3. Town institutions receiving income or assistance of some kind from the town or village in which located.
4. Sectarian institutions receiving income or assistance of some kind, or which are governed, in whole or in part, by a religious denomination.
5. Private institutions owned and controlled by individuals or corporations, and dependent on tuition fees.

Following out this idea he prepared the following table with each institution in its proper class:

Class.	Institution.
National	Alabama Agricultural and Mechanical College, Auburn.
	Florida Agricultural College, Lake City.
	North Georgia Agricultural College, Dahlonega.
	Agricultural and Mechanical College of Kentucky, Lexington.
	Agricultural and Mechanical College of the State of Mississippi, Oktibbeha County.
	North Carolina College of Agricultural and Mechanical Arts, Raleigh.
	Clemson Agricultural College, Clemson, S. C.
	University of Tennessee, Knoxville, Tenn.
State	University of Alabama, Tuscaloosa.
	East Florida Seminary, Gainesville.
	South Carolina Military Academy, Charleston.
Town	Gordon Institute, Barnesville, Ga.
	Middle Georgia Military and Agricultural College, Milledgeville.
Sectarian	Central University of Kentucky, Richmond.
	Georgetown College, Georgetown, Ky.
Private	Bingham School, Asheville, N. C.
	Davis School, Winston, N. C.
	Danville Military Institute, Danville, Va.

Of the national schools he says:

"The national schools have received during the year approximately $260,000 (including the appropriation under the Hatch act—experimental stations), and have appropriated for their military departments about $1,500, or slightly over one-half of 1 per cent. The greatest amount was appropriated at the Agricultural College of Alabama, $483.28; the smallest at the Florida Agricultural College, $35.75.

"It will be observed that the United States has directly appropriated a large sum of money toward the support of the national schools. When we add to this the pay and allowances of the professors of military science and tactics, and the value of equipment provided by the Government, the aggregate sum will average about $40,000 per school of this class.

"The law says of these schools that * * * 'The leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches as are related to agricultural and mechanic arts.' * * * While the agricultural and mechanic arts, or the industrial feature, is the predominant idea, the study of military tactics is required by the organic law, and the military department should have the same standing as any other department of the college."

Maj. J. P. Sanger, who inspected 11 colleges also located in the South Atlantic district, arranged them in three classes, as follows:

CLASS A—*Military colleges.*

1. Virginia Military Institute.
2. Pennsylvania Military College.

CLASS B—*Agricultural colleges.*

1. Virginia Polytechnic Institute.
2. Pennsylvania State College.
3. Maryland Agricultural College.
4. University of West Virginia.
5. Delaware State College.

CLASS C—*All other colleges.*

1. Girard College.
2. Grove City College.
3. St. John's College.
4. Allegheny College.

In this connection he reports:

"When we consider the large amount, $12,000,000, in land and scrip donated by the Government to the agricultural colleges, the amount invested in arms, etc., now loaned for purposes of instruction, over $350,000, the salaries and allowances of the Army officers who have been engaged on this duty since 1862, amounting now to an annual expenditure of $255,526.56, we may form some idea of the pecuniary interests of the Government in the several institutions and of the efforts put forth to impart military training to the youth of this country. That the investment has been a poor one in many instances, few will dispute who know the facts. On the other

hand, no one can deny the wisdom of the legislation or the plain duty of the War Department to make it effective, not in a few institutions only, but in every one to which an officer of the Army may be detailed. There is a natural tendency among all classes of our people, not professional soldiers, to shirk military duty. It is natural enough, for we are not a military people, making but little or no preparation for war until war is upon us, when, following a purely commercial instinct, we vainly try to make dollars do for discipline as well as for all other essentials.

"The theory that it is the duty of every citizen to arm in the defense of the country has in times past enrolled hundreds of thousands of American citizens in the ranks of our army, but with the passing of the enthusiasm which has prompted the movement, and being unsustained by discipline, straggling, absence, and desertion have followed in every army we have ever raised. These are grave military offenses in all armies, in all countries, and have been so from the beginning, because of their demoralizing and disintegrating influences. Military instruction in our colleges can do a great deal toward the suppression of these evils in the future by the inculcation of correct military principles. But in order to do this the colleges must be protected against the malingering influences to which they are exposed, and to which many of them yield. The legislation which had its origin in our deplorable lack of preparation disclosed by the civil war, must receive a different interpretation. It is probably correct to say that the statute of 1866 did not contemplate the detail of an officer to any institution at which there were less than 150 male students, or that any of them physically qualified would be exempt by the college authorities from drill, or at that any institution to which an officer might be sent there would be no practical military instruction whatever.

"Of the 104 colleges to which officers were detailed last year, 45 had less than 100 students under instruction, and 7 of these had less than 50. At Harvard College there has been no military organization and no drill, which are the principal, in fact, the only, means at the disposal of the officer of teaching discipline; for, unlike many other military accomplishments to which men are born, discipline must be learned. * * * Our unquestioned duty is to correct the defect made manifest by our experience in dealing with the subject through a period of thirty-five years. As the statute of 1862 and those enacted subsequently are apparently capable of different construction, I suggest such a modification as will limit the detail of officers to institutions having not less than 150 male students capable of receiving practical military instruction."

Theoretical course.

Theoretical instruction has been given at all schools, except 8; at 14 it was confined to the cadet officers and noncommissioned officers; at 12 it was optional or elective or voluntary, and at 68 it was compulsory upon one or more or all classes. The time devoted to this course during the year at the several schools varied from five to over two hundred hours, and at 24 it exceeded fifty hours. The scope and nature of the instruction has usually been left to the discretion of the military instructor, thus enabling him to establish desirable coherence between theoretical and practical instruction and apply to the one what is taught in the other.

Maj. E. A. Garlington reports:

"Each professor of military science and tactics has arranged a schedule of instruction presumably best suited to the local conditions; as a rule, it includes the Infantry Drill Regulations, Guard Manual, portions of the Army Regulations, Elements of Military Science, and lectures on a variety of subjects more or less related to the military. Where text-books are used and recitations required, the students retain some knowledge of the subjects treated; but where the lecture system, without recitations, prevails the impression left upon the minds of the students is very vague and shadowy. There has been a very general improvement, however, since 1895.

"The 'preparation of the usual reports and returns pertaining to a company' is, with one or two exceptions, neglected entirely. 'The organization and administration of the United States Army' receives some attention, but not enough, and there is a tendency to neglect the 'elementary principles governing the art of war' in an attempt to deal with historical events involving tactical questions beyond the comprehension of the students."

Practical course.

Practical instruction has been given at all schools except one, embracing setting-up and calisthenic exercises; squad, company, and battalion drills; artillery, cavalry, and signal drills; parades, reviews, and inspections; guard mounting, patrols, advance guards, and outposts; target practice, minor tactics, camping and field exercises. At 64 schools practically all the classes are enrolled in the military department; at 30, one or more of the classes are excused, and at 7 the course is voluntary or elective, which is in doubtful accord with the requirements of the law. Where but one class is excused from these drills it is usually the senior. The time devoted to this work varied from 26 to 400 hours during the year. At 47 schools it exceeded 100 hours each, and at 30

it was less than 80 hours each. It would seem that with an average school year of 40 weeks these 30 colleges hardly come up to the minimum requirements of the War Department, and 2 hours per week for this work looks like a meager allotment of time. At some of the schools a progressive, systematic instruction in drill prevails, and admirable results have been obtained, while at others the results leave much to be desired.

Maj. E. A. Garlington says:

"At all the schools except four, where the number of students would not permit, instruction has included the school of the battalion in close order. The drills before the inspector developed the need of more careful instruction in the school of the soldier. Nearly all of the faults observed were traceable to the fact that instruction in this school was hurried and superficial. The result is that there are only a few organizations in which the cadets are well set up or show a smart, snappy, alert demeanor. The first principles of marching, length of step, and handling of the legs are in most instances neglected altogether after a few drills, so that the cadets walk rather than march. To show the value of practice in marching, one of the best battalions inspected has less than three hours of instruction per week, but marches to music to and from meals three times a day.

"Ignorance of the proper commands for 'the firings' is very general. As these commands form the basis of fire discipline, and in their phraseology teach the elements of fire control, failure to teach them is a very serious omission.

"Many of the instructors apparently fail to grasp the full significance of the idea that thorough work in the school of the soldier makes the subsequent drill very nearly instruction of officers only. Of course there are difficulties in carrying out the idea, such as fluctuations in attendance, want of skilled instructors, the desire of the students themselves to 'get into the company,' and of the authorities to 'make a show,' but I think it is entirely feasible to devote more time to individual instruction if the officers will insist upon it."

But there are other obstacles. There are 5 schools that have practically no drill ground, and at 1 school the only drill ground available is a mile distant; and at 4 of these the provisions even for indoor drill are inadequate. At several others the size of the drill ground is limited, and over 50 per cent report insufficient facilities for indoor exercises. Of course these conditions affect the scope and thoroughness of military exercises to some extent.

APPENDIX B.

LIST OF THE INSPECTIONS ASSIGNED THE SEVERAL DISTRICTS.

NORTH ATLANTIC.

Posts.—Forts Schuyler and Slocum, N. Y.; Fort Trumbull, Conn.; Fort Adams, R. I.; Fort Warren, Mass.; Fort Preble, Me.; Fort Ethan Allen, Vt.; Plattsburg Barracks, Madison Barracks, Forts Niagara and Porter, West Point, Forts Columbus, Hamilton, Wood, and Wadsworth, and Willets Point, N. Y.

Armories and arsenals.—Springfield Armory and Watertown Arsenal, Mass.; Kennebec Arsenal, Me.; Watervliet and New York Arsenal, N. Y., and Sandy Hook Proving Ground and United States Powder Depot, N. J.

Supply depots.—Subsistence depots at Boston, Mass., and New York, N. Y.; Quartermaster's depot and medical depot at New York, N. Y.

Recruiting stations.—New York, N. Y.; Boston, Mass.; Albany, N. Y., and military posts where established.

Colleges.—The military departments of civil institutions of learning at which an officer of the Army is detailed are located at New Haven, Conn.; Kingston and Providence, R. I.; Amherst, Boston, and Cambridge, Mass.; Durham, N. H.; Orono, Me.; Saxtons River, Northfield, and Burlington, Vt.; Ithaca, Manlius, Fort Plain, Poughkeepsie, Cornwall on Hudson, Fordham, and New York, N. Y.; and New Brunswick and South Orange, N. J.

Disbursements and accounts of disbursing officers at the above-named posts, arsenals, armories, supply depots, and at New London, Conn.; Newport, R. I.; Boston, Mass.; Portland, Me.; Burlington, Vt., and Oswego, Buffalo, Governors Island, and New York, N. Y.

SOUTH ATLANTIC.

Posts.—Forts McHenry and Washington, Md.; Washington Barracks, D. C.; Forts Myer and Monroe, Va.; St. Francis Barracks, Key West Barracks, and Fort Barrancas, Fla.; Jackson Barracks, La., and Fort McPherson, Ga.

Arsenals and armories.—Allegheny and Frankford arsenals, Pa.; Fort Monroe Arsenal, Va., and Augusta Arsenal, Ga.

Supply depots.—Quartermaster's depots at Philadelphia, Pa., and Washington, D. C., and subsistence depot at New Orleans, La.

Recruiting stations.—Pittsburg, Harrisburg, and Philadelphia, Pa.; Richmond, Va., and military posts were established.

Colleges.—The military departments of civil institutions of learning at which an officer of the Army is detailed, located at Morgantown, W. Va.; Cincinnati, Wilberforce, Granville, and Columbus, Ohio; Meadville, Grove City, State College, Lancaster, Philadelphia, and Chester, Pa.; Newark, Del.; College Park and Annapolis, Md.; Lexington, Blacksburg, and Danville, Va.; Asheville and Raleigh, N. C.; Charleston, S. C.; Gainesville and Lake City, Fla.; Milledgeville, Barnesville, and Dahlonega, Ga.; Clemson, S. C.; Auburn, Ala.; Baton Rouge, La.; University, Ala.; Agricultural College and St. Thomas Hall, Holly Springs, Miss.; Knoxville, Tenn.; and Richmond, Lexington, and Georgetown, Ky.

Disbursements and accounts of disbursing officers at the above-named posts, arsenals, armories, supply depots, and at Washington, D. C.; Pittsburg, Midvale, South Bethlehem, and Philadelphia, Pa.; Wilmington, Du Pont Powder Works, near Wilmington, and Delaware City, Del.; Baltimore, Md.; Norfolk, Va.; Wilmington, N. C.; Charleston, S. C.; Savannah, Ga.; St. Augustine, Fla.; Montgomery and Mobile, Ala.; New Orleans and Fort St. Philip, La.; Vicksburg, Miss.; Atlanta, Ga.; and Chattanooga, Tenn.

MIDDLE.

Posts—Fort Sheridan, Ill.; Fort Brady, Mich.; Fort Snelling, Minn.; Jefferson Barracks, Mo.; Fort Logan H. Roots, Ark.; Fort Thomas, Ky.; Columbus Barracks, Ohio; and Fort Wayne, Mich.

Arsenals and armories.—Rock Island Arsenal, Ill.; St. Louis powder depot, Mo.; Columbia Arsenal, Tenn.; and Indianapolis Arsenal, Ind.

Supply depots.—Quartermaster's, subsistence, and medical depots at St. Louis, Mo.; quartermaster's depot at Jeffersonville, Ind.; and subsistence depot at Chicago, Ill.

Recruiting stations.—Chicago, Ill.; Milwaukee, Wis.; St. Paul, Minn.; St. Louis, Mo.; Nashville, Tenn.; Evansville and Indianapolis, Ind.; Louisville, Ky.; Cincinnati and Cleveland, Ohio; and military posts were established.

Army and Navy Hospital at Hot Springs, Ark.

Colleges.—The military departments of civil institutions of learning at which an officer of the Army is detailed, located at Delafield and Appleton, Wis.; Fargo, N. Dak.; Minneapolis and Faribault, Minn.; Madison, Wis.; Dixon, Galesburg, and Upper Alton, Ill.; St. Louis, Mo.; Memphis and Lebanon, Tenn.; Vincennes, Ind.; Delaware and Ada, Ohio; Orchard Lake and Lansing, Mich.; Greencastle, Culver, and Lafayette, Ind.; and Champaign, Ill.

Disbursements and accounts of disbursing officers at the above-named posts, arsenals, armories, supply depots, hospitals, and at Milwaukee, Wis.; Duluth and St. Paul, Minn.; Rock Island, Ill.; St. Louis, Mo.; Little Rock, Ark.; Memphis and Nashville, Tenn.; Louisville, Ky.; Cincinnati and Cleveland, Ohio; Detroit and Grand Rapids, Mich.; and Chicago, Ill.

NORTHERN.

Posts.—Fort Logan, Colo.; Forts Riley and Leavenworth, Kans.; Forts Crook, Niobrara, and Robinson, Nebr.; Fort Meade, S. Dak.; Fort Custer, Camp Merritt, and Fort Keogh, Mont.; Fort Yates, N. Dak.; Fort Yellowstone and Camp at Lower Geyser Basin, Wyo., and Camp Pilot Butte, and Forts Washakie, and D. A. Russell, Wyo.

Supply depots.—Subsistence depots at Denver, Colo.; Kansas City, Mo., and Omaha, Nebr., and quartermaster's depot at Omaha, Nebr.

Colleges.—The military departments of civil institutions of learning at which an officer of the army is detailed, located at Manhattan and Baldwin, Kans.; Lexington, Boonville, and Columbia, Mo.; Mount Pleasant, Iowa City, Mount Vernon, and Cedar Falls, Iowa; Brookings and Vermilion, S. Dak.; Lincoln and Crete, Nebr.; Laramie, Wyo., and Fort Collins, Colo.

Disbursements and accounts of disbursing officers at the above-named posts, and supply depots, and at Kansas City, Mo.; Omaha, Nebr.; Sioux City, Iowa; Bismarck, N. Dak., and Denver, Colo.

SOUTHERN.

Posts.—San Diego Barracks, Cal.; Fort Huachuca, Camp at San Bernardino, Fort Grant, and San Carlos, Ariz.; Fort Bayard, N. Mex.; Forts Bliss, Clark, Eagle Pass, Sam Houston, McIntosh, Ringgold, and Brown, Tex.; Forts Sill and Reno, Okla.; Fort Wingate, N. Mex., Fort Apache and Whipple Barracks, Ariz.

Arsenal.—San Antonio Arsenal, Tex.

Recruiting stations.—Dallas, Tex., and military posts where established.

Colleges.—Arkansas Industrial University, Fayetteville, Ark.; Ouachita Baptist College, Arkadelphia, Ark.; Austin College, Sherman, Tex.; Baylor University, Waco, Tex., and the Agricultural and Mechanical College of Texas, College Station, Tex.

Disbursements and accounts of disbursing officers at the above-named posts and arsenal, and of other disbursing officers at San Antonio and Galveston, Tex., and Albuquerque, N. Mex.

PACIFIC.

Posts.—Angel Island, Alcatraz Island, Fort Mason, and Benicia Barracks, Cal.; Vancouver Barracks, and Forts Canby, Walla Walla, and Spokane, Wash.; Fort Sherman, Idaho; Forts Missoula, Harrison, and Assinniboine, Mont.; Boise Barracks, Idaho; Forts Douglas and Du Chesne, Utah, and Presidio of San Francisco, Cal.

Arsenals.—Benicia Arsenal, Cal.

Supply depots.—Quartermaster's, subsistence, and medical depots, San Francisco, Cal.

Recruiting stations.—Portland, Oreg.; Seattle, Wash., and military posts where established.

Colleges.—The military departments of civil institutions of learning at which an officer of the Army is detailed, located at Berkeley and San Rafael, Cal.; Corvallis, Oreg.; Seattle, Wash.; Moscow, Idaho; Pullman, Wash.; Bozeman, Mont.; Logan, Utah, and Reno, Nev.

Disbursements and accounts of disbursing officers at the above-named posts, arsenal, supply depots, and at Portland, Oreg.; Vancouver Barracks, Seattle, and Spokane, Wash.; Helena, Mont., and San Francisco, Cal.

NOTE.—Not to exceed three periodical tours of inspection will be made each year to such of the places as the Inspector-General of the Army may designate, and such ungarrisoned posts and national cemeteries as are along the general route of travel will be inspected once in two years.

APPENDIX C.

Statements showing contract price, and amount purchased, of 20 principal articles of food at the several Branches of the National Home for Disabled Volunteer Soldiers, and the United States Soldiers' Home, Washington, D. C.

Branches.	Contract price for quarter ending June 30, 1897.									
	Flour, pound.	Fresh beef, pound.	Corn beef, pound.	Coffee pound.	Tea, pound.	Bacon, pound.	Salt pork, pound.	Potatoes, pound.	Fresh fish, pound.	Cod-fish, pound.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
Eastern	2.48	6.73	4.94	13⅜	24.5	6.75	4.24	0.⅜	3 to 6½	5½
Northwestern	1.96	5.84	.....	18.5	29	6.45	4	.433	6.5	5.5
Pacific	2.60	5.60	3	19.2	13.5	8.85	6.75	.69	.....	.....
Western	1.90 2.10	5.96	4.97	19	28	7.79	5.23	.65	7	7.5
Marion	2.90	5.98 6.74	5⅜	19.5	24	7.25	[1]900	[2]39	5	.....
Central	2.17	5.515	.....	19.625	29.43	5.47	5.47	[2]29.99	6.2	3.5
Southern	[1]487	5.59	5.38	15⅜	30	5⅜	[1]920	[2]43	5	4
United States Soldiers' Home[3]	2.09	5.75	2.63	13.24	24 30	7.5	6.35	.75	5	3.45

[1] Per barrel. [2] Per bushel. [3] Quarter ending Sept. 30, 1897.

Statements showing contract price, and amount purchased, etc.—Continued.

Branches.	Contract price for quarter ending June 30, 1897.									
	Fresh mackerel, pound.	Navy beans, pound.	Lima beans, pound.	Ham, pound.	Butter, pound.	Sirup, gallon.	Cheese, pound.	Sugar, A, pound.	Sugar, C, pound.	Sugar, granulated, pound.
	Cents.	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*	*Cents.*
Eastern	5.24	2.35	[1]60	8.72	14½	18	10½	.....	3.77	4.485
Northwestern	7.95	1.75	3.75	9	16	22	9.875	4.2	.....	4.51
Pacific	.....	1.77	2.37	10	15	26.75	.....	.....	4.34	5.025
Western	8.25	2	3.50	9.45	[2]11.39	28	11.75	.....	4.34	4.72
Marion	[3]7	1⅝	.....	9.25	17.5	19	10.25	4.1249	.....	4.4399
Central	7.10	1.75	3.132	9.37	.....	16.95	10.125	4.243	3.94	4.488
Southern	5⅛	2.23	2.97	10.05	[2]10.5	23	11.5	4.165	3.63	4.5
United States Soldiers' Home*	.....	1.5	2.49	9.84	[4]12.2	15	8.98	4.81	4.12	4.93

[1] Per dozen cans. [2] Oleomargarine. [3] Salt mackerel. [4] Butterine.

Branches.	Amount (pounds) purchased during quarter ending June 30, 1897.									
	Flour.	Fresh beef.	Corn beef.	Coffee.	Tea.	Bacon.	Salt pork.	Potatoes.	Fresh fish.	Codfish.
Eastern	91,532	41,586	30,276	10,283	1,595	6,980	7,600	113,700	12,700	4,337
Northwestern	94,080	110,000	.....	15,000	800	13,000	3,000	150,000	15,000	3,500
Pacific	82,320	82,618	4,800	8,704	1,595	8,983	2,000	96,568	.....	.....
Western	131,600	89,673	12,000	13,797	1,164	4,914	2,000	165,960	9,258	4,800
Marion	90,000	28,239	16,400	9,000	911⅓	5,300	[1]8	[2]1,369	4,750	.....
Central	245,000	277,019	.....	38,442	4,165	3,850	14,221	[2]6,105	18,850	8,888
Southern	[1]800	149,356	28,000	22,296	2,137	13,500	3,200	[2]3,277⅔	7,555	6,000
United States Soldiers' Home*	38,512	34,257	8,838	4,795	555	1,985	5,629	24,671	3 010	1,240

Branches.	Amount (pounds) purchased during quarter ending June 30, 1897.									
	Fresh mackerel.	Navy beans.	Lima beans.	Ham.	Butter.	Sirup.	Cheese.	Sugar, A.	Sugar, C.	Sugar, granulated.
						Galls.				
Eastern	7,400	9,082	[3]500	8,758	17,746	358⅓	5,209	.....	19,099	3,255
Northwestern	2,000	4,500	2,250	15,000	16,000	75	3,500	8,000	.....	25,000
Pacific	.....	4,000	5,000	500	15,835	1,084	.....	.....	19,088	2,365
Western	13,200	8,400	1,200	2,992	[4]20,304	895	3,696	.....	17,939	4,992
Marion	[5]4,200	5,077	.....	11,574	14,205.5	212	3,300	21,467	.....	3,092
Central	18,000	10,042	3,757	44,546	.....	737	13,200	43,958	24,092	8,800
Southern	20,000	1,375	2,900	1,960	[4]26,400	329	7,150	10,700	31,500	3,342
United States Soldiers' Home[7]	.....	1,200	50	5,356.5	[6]5,760	57	1,423	6,598	6,599	285

[1] Barrels. [2] Bushels. [3] Cans. [4] Oleomargarine. [5] Salt mackerel. [6] Butterine. [7] Quarter ending Sept. 30, 1897.

REPORT OF THE JUDGE-ADVOCATE-GENERAL.

REPORT

OF THE

JUDGE-ADVOCATE-GENERAL, U.S.A.

WAR DEPARTMENT,
JUDGE-ADVOCATE GENERAL'S OFFICE,
Washington, D. C., September 27, 1897.

Hon. RUSSELL A. ALGER,
Secretary of War.

SIR: I have the honor to submit the annual report of the Judge-Advocate-General's Department for the twelve months ending August 31, 1897.

Commissioned officers tried by general court-martial:	
Records reported upon and submitted to the Secretary of War for action of the President	3
Records received, revised, and recorded, not requiring the action of the President (convicted)	1
Cadets of the United States Military Academy tried by general court-martial:	
Records reported upon and submitted to the Secretary of War	1
Enlisted men tried by general court-martial (convicted, 1,263; acquitted, 116)	1,379
Total trials by general court-martial	1,384

Trials by general court-martial:	
Twelve months ending August 31, 1896	1,486
Twelve months ending August 31, 1897	1,384
Decrease	102

Decrease in number of trials by general court-martial, as compared with previous twelve months:	
Twelve months ending August 31, 1893	28
Twelve months ending August 31, 1894	9
Twelve months ending August 31, 1895	461
Twelve months ending August 31, 1896	242
Twelve months ending August 31, 1897	102

The following table shows, approximately, the number of convictions of different offences by general court-martial during the twelve months ending August 31, 1897:

Seventeenth article of war:	
Losing clothing	18
Losing Government property	15
Selling clothing	12
Twentieth article of war:	
Disrespect to commanding officer	12
Twenty-first article of war:	
Assaulting superior officer	1
Attempting to strike superior officer	1
Disobeying superior officer	61
Lifting up weapon against superior officer	1

Thirty-first article of war:	
Lying out of quarters	2
Thirty-second article of war:	
Absence without leave	284
Thirty-third article of war:	
Failure to attend drill, roll call, etc	249
Thirty-eighth article of war:	
Drunkenness on duty	122
Thirty-ninth article of war:	
Quitting post	32
Sleeping on post	29
Fortieth article of war:	
Quitting guard	21
Forty-seventh article of war:	
Desertion	244
Sixtieth article of war:	
Larceny	11
Selling Government property	3
Sixty-first article of war:	
Duplication of pay vouchers	2
Other offences charged as "conduct unbecoming an officer and a gentleman"	6
Sixty-second article of war:	
Absence without leave, not chargeable under the Thirty-second article of war	52
Abusing public animal	5
Allowing prisoner to escape	12
Assault	30
Assault and battery	47
Assault with dangerous or deadly weapon	22
Assault with intent to kill	8
Assaulting a sentinel	1
Attempt to suborn a witness	1
Breach of arrest	59
Carrying concealed weapons	2
Committing a nuisance	5
Disobedience of standing orders or regulations	30
Disobeying commissioned officer	25
Disobeying noncommissioned officer	165
Disobeying sentinel	10
Disposing of clothing	2
Disorderly conduct	50
Disrespect to noncommissioned officer	19
Disrespect to superior officer	9
Disrespect to sentinel	1
Drunkenness	105
Drunk and disorderly	55
Drunkenness, etc., causing arrest, etc., by civil authorities	8
Embezzlement	2
Escaping from military prison	1
Failure to pay debts	1
False statement or report	50
False swearing	1
Fighting	4
Forgery	4
Fraudulent enlistment	80
Indecent exposure of person	2
Insubordinate conduct toward commissioned officer	28
Insubordinate conduct toward noncommissioned officer	88
Larceny	66
Malingering	1
Maliciously setting fire to a public building	1
Neglect of duty	43
Perjury	1
Resisting arrest	18
Robbery	1
Selling, losing, or wasting Government property	19
Threatening superior officer	1
Threatening noncommissioned officer	1
Disorder, etc., charged as "conduct to the prejudice of good order and military discipline" (not included under previous heads)	108

The following table shows the desertions, classified according to the limit of punishment prescribed in the executive order of the President, published in General Orders, No. 16, Headquarters of the Army, 1895:

	Number.	Limit of confinement.
		Months.
Surrendered:		
After an absence of not more than 30 days	22	12
After an absence of more than 30 days	81	18
After an absence of more than 30 days and prior conviction considered	2	30
Apprehended:		
In service not more than 6 months at time of desertion	64	18
In service more than 6 months	72	30
In service more than 6 months and prior conviction considered	3	42
Total number of desertions	244	
Average limit of confinement		21.39+

Convictions of desertion for twelve months ending—

August 31, 1894	518
August 31, 1895	255
August 31, 1896	256
August 31, 1897	244

The number of trials by inferior courts-martial, the number resulting in acquittal, and the number of different men tried in the different departments are shown by the following table:

Department of—	Trials.			Acquittals.	Different men tried.
	Garrison.	Summary.	Total.		
California	18	955	973	29	669
Colorado	36	1,594	1,630	48	995
Columbia	20	746	766	21	475
East	90	4,084	4,174	220	2,536
Dakota	15	1,142	1,157	55	794
Missouri	44	2,235	2,279	106	1,410
Platte	46	1,236	1,282	48	912
Texas	13	825	838	34	532
At posts not in any of the above departments	7	323	330	6	182
Total	289	13,140	13,429	567	8,505

The number of trials by inferior courts-martial for the twelve months ending August 31, 1896, was 13,556, as against 13,429 for the twelve months covered by this report; showing a decrease of 127 cases.

CRIMINAL JURISDICTION IN MILITARY RESERVATIONS.

The House of Representatives, on the 24th of March, 1896, passed a bill (H. R. 6345) to the following effect:

That when any offense is committed in any place jurisdiction over which has been retained by the United States, or ceded to it by a State, or which has been purchased with the consent of a State for the erection of a fort, magazine, arsenal, dockyard, or other needful building, the punishment for which offense is not provided for by any law of the United States, the person committing such offense shall, upon conviction in a circuit or district court of the United States for the district in which the offense was committed, be liable to, and receive, the same punishment as the laws of the State in which such place is situated now provide for the like offense when committed within the jurisdiction of such State, and the said courts are hereby vested with jurisdiction for such purpose; and no subsequent repeal of any such State law shall affect any such prosecution.

The Senate, however, did not take any action on the bill.

I now invite attention to the subject again. The establishment of a system of criminal procedure in military reservations and other places

over which the United States exercises similar jurisdiction is of great importance, and I strongly recommend that the matter be laid before the next Congress, with a view to remedying the existing condition.

In the report of the Committee on the Judiciary of the House of Representatives (House Report No. 446, Fifty-fourth Congress, first session) the necessity for such legislation is thus explained:

The reasons for its enactment are fully set forth in the following from a letter from the Judge-Advocate-General of the Army:

"Section 5391 of the Revised Statutes prescribes that—

"'If any offense be committed in any place which has been or may hereafter be ceded to and under the jurisdiction of the United States, which offense is not prohibited, or the punishment thereof is not specially provided for by any law of the United States, such offense shall be liable to and receive the same punishment as the laws of the State in which such place is situated, now in force, provide for the like offense when committed within the jurisdiction of such State; and no subsequent repeal of any such State law shall affect any prosecution for such offense in any court of the United States.'

"In the case of the United States *v.* Barnaby (51 Fed. Rep., 20) Judge Knowles, discussing this section, says:

"'This statute has been construed by the Supreme Court in the case of United States *v.* Paul (6 Pet., 141) and held to apply to State statutes punishing crimes which existed at the time of the passage of this statute. This decision has at no time been reversed or doubted by that court, and was a contemporaneous judicial construction of the same, and should be adhered to. Considering the language of the statute (and I do not see how any other conclusion could be reached), Congress might be willing to adopt the laws of a State which existed at the time of the passage of a statute by it, but would hardly be willing beforehand to adopt all the criminal statutes a State might in future enact. A statute to this effect might be classed as delegating legislative authority, which is not proper. This statute was passed in 1825. But the construction contended for, namely, that it applied to any laws which might exist in any State, at any time when a place might be ceded by it to the United States, brings us to no different conclusion.'

"And in the case of the United States *v.* Curran, in the United States district court for the district of Colorado, in 1892, Judge Hallett held as follows:

"'The United States against William E. Curran and others is a prosecution for inciting a riot and committing an assault upon certain Chinamen on the reservation at Fort Logan.

"'This is alleged to be in violation of the law of the State, which is put in force by section 5391 of the Revised Statutes of the United States. This section was enacted first in 1825 and again in 1866, and it refers to the laws of States then existing. The act was so construed in Paul's Case, 6 Peters, 141 (U. S. Supreme Court).

"'As Colorado was not then a State in the Union, none of its laws were adopted or put in force by this act. This section will never be operative in Colorado to put in force laws of the State in respect to crimes committed on Government reservations unless reenacted.

"'The motion to quash will be sustained.'

"Under this construction the only criminal law in force on a place under the exclusive jurisdiction of the United States is such criminal law of the United States as may be applicable, and, if it is a place jurisdiction over which has been ceded by a State existing in 1866, the laws of the State in force at that time. In the two cases cited the criminal laws of the State could not be enforced over the ceded territory because the State was not in existence at the time of the enactment of 1866, from which section 5391 of the Revised Statutes was taken. And in States which were in existence at that time the criminal laws adopted since can not, under the legislation as interpreted by the courts, be extended over such territory.

"So defective is the law that in the above-mentioned cases riot, aggravated assault, false imprisonment, and assault with intent to commit murder, committed on territory within the exclusive jurisdiction of the United States, were held to be unprovided for and unpunishable. That the law needs to be amended is evident, and to that end I submit the draft of a bill to 'establish a criminal jurisdiction over places ceded to the United States for certain purposes.' It is appended to this report, and the recommendation is made that it be brought to the attention of Congress. It is in substantially the same language as a bill favorably reported by the Committee on the Judiciary of the House of Representatives at the first session of the Fifty-third Congress. It proposes to adopt for these places only the existing criminal laws of the States in which they are situated, and this will necessitate the reenactment of the law from time to time; but it is all that can be done, because, as was pointed out when this subject was before the Fifty-third Congress, a law

adopting in advance all the criminal laws of a State in force at the time of the commission of the criminal act would be, as to any such criminal legislation of a later date than the Federal enactment, a delegation of legislative power to the State, and therefore inoperative."

In examining this matter at the present time, I find that the title of the bill is defective. The object of the bill is to establish a system of criminal jurisdiction in military reservations and other places held by the United States, in whatever way, whether by cession or otherwise, the places themselves have been actually acquired. The bill is in effect an amendment of section 5391 of the Revised Statutes, and I would suggest that it be so modified as to show this, and that the title be also changed, so as to read: "A bill to amend section five thousand three hundred and ninety-one of the Revised Statutes."

AMENDMENT OF THE SUMMARY COURT ACT.

The Committee on Military Affairs of the House of Representatives, Fifty-fourth Congress, reported favorably the following bill for the amendment of the summary court act:

A BILL to amend an act entitled "An act to promote the administration of justice in the Army," approved October first, eighteen hundred and ninety, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the act entitled "An act to promote the administration of justice in the Army," approved October first, eighteen hundred and ninety, as supplemented and amended by subsequent legislation, be, and the same is hereby, amended so as to read as follows:

"That in time of peace the commanding officer of each post, station, and command in the Army shall, when practicable, appoint for such place a summary court, to consist of one officer of such post, station, or command, to be designated by him, before whom enlisted men who are to be tried for offenses such as were prior to the passage of the act 'to promote the administration of justice in the Army,' approved October first, eighteen hundred and ninety, cognizable by garrison or regimental courts-martial, shall be brought to trial within twenty-four hours of the time of the arrest, or as soon thereafter as practicable, except when the accused is to be tried by general court-martial; but such summary court may be appointed and the officer designated by superior authority when by him deemed desirable; and the officer holding the summary court shall have power to administer oaths and to hear and determine such cases, and when satisfied of the guilt of the accused adjudge the punishment to be inflicted, which said punishment shall not exceed confinement at hard labor for one month and forfeiture of one month's pay, and, in the case of a noncommissioned officer, reduction to the ranks in addition thereto; that there shall be a summary court record book kept at each military post and in the field at the headquarters of the command, in which shall be entered a record of all cases heard and determined and the action had thereon; and no sentence adjudged by said summary court shall be executed until it shall have been approved by the post or other commander: *Provided,* That when but one commissioned officer is present with a command he shall hear and finally determine such cases: *And provided further,* That no one while holding the privileges of a certificate of eligibility to promotion shall be brought before a summary court, and that noncommissioned officers shall not, if they object thereto, be brought to trial before summary courts without the authority of the officer competent to order their trial by general court-martial, but shall in such cases be brought to trial before garrison, regimental, or general courts-martial, as the case may be.

"SEC. 2. That the commanding officers authorized to approve the sentences of summary courts and superior authority shall have power to remit or mitigate the same.

"SEC. 3. That post and other commanders shall, on the last day of each month, make a report to the Department headquarters of the number of cases determined by summary court during the month, setting forth the offenses committed and the penalties awarded, which report shall be filed in the office of the judge-advocate of the Department, and may be destroyed when no longer of use.

"SEC. 4. That soldiers sentenced by court-martial to dishonorable discharge and confinement shall, until discharged from such confinement, remain subject to the Articles of War and other laws relating to the administration of military justice.

"SEC. 5. That it shall be lawful for any civil officer having authority under the

laws of the United States, or of any State, Territory, or district to arrest offenders, to summarily arrest a deserter from the military service of the United States, and deliver him into the custody of the military authority of the General Government.

"SEC. 6. That this act shall take effect sixty days after its passage."

I extract the following from the report of the Committee on Military Affairs (Rep. No. 2132, H. R., Fifty-fourth Congress, first session):

The law proposed to be amended by this bill was enacted in 1890, and became chapter 1259 of the acts of the Fifty-first Congress. A favorable report, made to the House on March 25, 1890, upon the bill, by the Committee on Military Affairs, contains the following:

"The subject of courts-martial and the punishment of military offenses is one that has attracted unusual attention within the past few years, and several bills have already been reported favorably at this session looking to the simplification of the procedure, the limitation of the powers of the court-martial to inflict punishment within certain prescribed limits, to be fixed by the President, and to provide that judge-advocates shall not be permitted to be present with the courts while they are deliberating on their verdict."

The Secretary of War, in his annual report preceding such report of the Committee on Military Affairs of the House of Representatives, recommended "the revision of the Articles of War, and that provision be made for the punishment of certain minor offenses, under well-defined restrictions, without the intervention of a court-martial, and oftentimes long precedent confinement in the guardhouse."

In respect to the then proposed measure the Secretary of War, on March 17, 1890, stated in a letter, among other things, "that the provisions of the bill as framed, with the amendments suggested, should they become a law, would accomplish in their execution a reformation which has long been deemed desirable by officers of the Army who have given the subject-matter thoughtful consideration, and meet my approval."

The law accordingly then enacted has been in force between five and six years, and as the true test of the efficacy of every law is its practical application to the subjects to which it specially relates, proceedings under this law have developed its imperfections, and the present measure is designed to remedy those defects. This bill was prepared in the office of the Judge-Advocate-General, United States Army, and therefore has the approval of that officer. In his annual report to the Secretary of War for the year ending August 31, 1895, page 7, are found the following suggestions with reference to the subjects embraced in this bill:

"The summary court has proved to be a practical substitute for the garrison and regimental court-martial, and has given satisfaction throughout the Army, but when the summary court act was passed we were making an experiment, and it is not surprising that in the course of five years of this court's existence we have discovered that the system can be materially improved. The summary court, under the act creating it, can only exist at posts where there is a 'line officer second in rank,' or at stations where only staff officers are on duty, or where but one commissioned officer is present with a command. But these do not cover all cases intended to be provided for. No provision is made for a command with which there is present a line officer (in command) and one or more staff officers—a detached command, for example, with one line officer and a surgeon. Nor does the summary act provide for a command under a staff officer, and with which there is one and only one line officer on duty. A further objection to the present system is that certain officers 'second in command' are designated by the statute as the summary court, and pursuant to this fixed designation they must hold the court, whether fitted for the discharge of the duty or not."

The enactment of the substitute herewith reported would remedy these deficiencies.

The reason for the legislation proposed in the fourth section of this bill is explained in my annual report for 1895, as follows:

Another matter, to which I have referred as requiring legislation, is the subjection to the Articles of War of military prisoners discharged from the service and serving sentences of courts-martial. Under section 1361 of the Revised Statutes prisoners in confinement in the military prison at Fort Leavenworth under sentences of courts-martial were "liable to trial and punishment by courts-martial under the rules and Articles of War for offenses committed during the said confinement." The constitutionality of this provision has recently received careful consideration at the hands of the honorable Amos M. Thayer, United States circuit judge, whose decision is of such importance in this connection that I attach it as an appendix to this report. It will be noticed that Judge Thayer discusses, among other things, the effect of a

discharge from the service by sentence of court-martial when accompanied with the imposition of a term of confinement; explaining it in the following language:

"A discharge executed under these circumstances and for such a purpose can not be said to have had the effect of severing his connection with the Army and of freeing him forthwith from all the restraints of military law. The discharge was no doubt operative to deprive him of pay and allowances, but so long as he was held in custody under sentence of a court-martial, for the purpose of enforcing discipline and punishing him for desertion, he remained subject to military law which prevailed in the prison where he was confined, and subject also to the jurisdiction of a court-martial for all violations of such law committed while he was so held."

The military prison has now been discontinued, and military prisoners who have been discharged from the service by virtue of their sentences, but are held under military authority to serve terms of confinement, are now serving their terms at military posts. There is, however, no law which subjects them to the discipline of trial by court-martial under the Articles of War, and an important means of making confinement an effective military punishment is, therefore, lacking. To announce to the prisoner that, no matter what he may do, he can not have the term of his confinement extended is a direct encouragement to insubordination and must impair the effect of military imprisonment as an exemplary punishment. In order to remedy this evil, it is very desirable that there should be legislation declaring that soldiers sentenced by court-martial to dishonorable discharge and confinement shall, until discharged from such confinement, remain subject to the Articles of War and other laws relating to the administration of military justice.

Neither of the two bills mentioned has become law, but there is no opposition to either of them. They are recognized as being judicious measures, and I therefore bring them forward again with the hope that Congress will pass them at its next session.

REWARD FOR THE APPREHENSION OF DESERTERS.

I beg leave again to call attention to the entire insufficiency of the present reward for the apprehension of deserters. Formerly the amount of the reward was not fixed by statute, but was left to the Secretary of War to regulate. For many years $30 was the amount designated, but this not being considered sufficient it was increased to $60. In 1894 the power of fixing the amount was taken away from the Secretary of War by Congress itself prescribing what it should be, namely, $10. So entirely insufficient is this amount that it is little better than none at all, and, in the opinion of many who are in the best position for judging, it encourages desertion. I think that the best plan would be to return to the former system, when the amount of the reward was regulated by the Secretary of War, but in any event it should be largely increased.

The reports of the judge-advocates of the Departments are appended hereto.

Very respectfully,

G. NORMAN LIEBER,
Judge-Advocate-General.

REPORT OF LIEUT. COL. EDWARD HUNTER, DEPUTY JUDGE-ADVOCATE-GENERAL, JUDGE-ADVOCATE, DEPARTMENT OF DAKOTA.

HEADQUARTERS DEPARTMENT OF DAKOTA,
OFFICE OF THE JUDGE-ADVOCATE,
St. Paul, Minn., September 24, 1897.

The JUDGE-ADVOCATE-GENERAL, UNITED STATES ARMY,
Washington, D. C.

SIR: Under the requirements of paragraph No. 891, Army Regulations of 1895, I have the honor to submit the following report based upon the records of this office for the twelve months ending August 31, 1897.

Enlisted men tried by general courts-martial	149
Convictions	125
Acquittals	14
Number of cases tried by inferior courts during the year	1,157
Summary courts	1,142
Garrison courts	15
Total number of men tried by inferior courts	794

The following list shows the number of convictions of different offenses by general courts-martial during the year:

Seventeenth article of war:	
Losing Government property	1
Selling clothing	1
Twentieth article of war:	
Disrespect to commanding officer	1
Twenty-first article of war:	
Disobeying superior officer	10
Thirty-first article of war:	
Lying out of quarters	1
Thirty-second article of war:	
Absence without leave	32
Thirty-third article of war:	
Failure to attend drill, roll call, etc	13
Thirty-eighth article of war:	
Drunkenness on duty	11
Thirty-ninth article of war:	
Quitting post	5
Sleeping on post	3
Fortieth article of war:	
Quitting guard	3
Forty-seventh article of war:	
Desertion	15
Sixtieth article of war:	
Selling Government property	2
Larceny	4
Sixty-second article of war:	
Absence without leave not chargeable under thirty-second article of war	1
Assault	5
Assault with dangerous or deadly weapon	2
Assault with intent to kill	2
Breach of arrest	6
Disobeying commissioned officer	2
Disobeying noncommissioned officer	25
Disrespect to superior officer	7
Drunkenness	8
Drunkenness, etc., causing arrest by civil authorities	2
Escaping from guard or arrest	1
Fighting	3
Forgery	1
Fraudulent enlistment	9
Insubordinate conduct towards noncommissioned officer	25
Larceny	7
Malingering	1
Neglect of duty	1

Sixty-second article of war—Continued.

Resisting arrest	2
Disorders, etc., charged as "conduct to the prejudice of good order and military discipline" (not included under previous heads)	56
Total	268

Dishonorably discharged by general courts-martial.

For desertion	8
Through use of previous convictions	12
For serious offenses	34
Total	54

Noncommissioned officers reduced.

By sentence of general courts-martial	2
By sentence of inferior courts	9
Total	11

Amount of fines imposed by summary courts, $4,019.25.

I think commanding officers should have discretion as to the submission, to a summary court, of previous convictions.

I recommend that when sentences of general prisoners are for two years or more, ten days' good conduct time be allowed instead of five, as at present.

I am of the opinion that our court-martial practice would be improved if one or more officers or enlisted men at our large posts were instructed in stenography.

Respectfully submitted.

EDWARD HUNTER,
Deputy Judge-Advocate-General, United States Army.

APPENDIX.

HEADQUARTERS DEPARTMENT OF DAKOTA,
OFFICE OF THE JUDGE-ADVOCATE,
St. Paul, Minn., July 14, 1897.

The ADJUTANT-GENERAL, DEPARTMENT OF DAKOTA,
St. Paul, Minn.

SIR: In compliance with instructions from your office dated July 3, 1897, I have the honor to submit the following report of the business of this office for the fiscal year ended June 30, 1897:

One commissioned officer was tried.

The number of enlisted men tried and the places of trial are shown by the following table:

Posts.	General courts.				Inferior courts.			Average enlisted strength.
	Pertaining to posts proper.	Pertaining to other posts in department.	Pertaining to organizations out of department.	Total tried at posts.	Garrison.	Summary.	Total inferior courts.	
Fort Assiniboine, Mont	32	.....	1	33	.....	238	238	488
Fort Custer, Mont	26	7	.....	33	6	197	203	361
Fort Harrison, Mont	7	.....	1	8	1	30	31	132
Fort Keogh, Mont	14	.....	1	15	2	147	149	329
Fort Missoula, Mont	16	2	1	19	.....	134	134	208
Fort Snelling, Minn	28	3	.....	31	5	255	260	534
Fort Yates, N. Dak	9	.....	.....	9	1	84	85	196
Fort Yellowstone, Wyo	2	.....	.....	2	.....	91	91	119
Total	134	12	4	150	15	1,176	1,191	2,365
Acquittals	.....	.....	.....	14	5	46	51	.....
Convictions	.....	.....	.....	136	10	1,130	1,140	.....
Noncommissioned officers reduced during year	.....	.....	.....	2	1	8	9	.....

Table showing the organizations in which the trials originated.

Organizations.	General courts.	Inferior courts.	
		Garrison.	Summary
Noncommissioned staff	1	.....	.....
Hospital Corps	2	1	9
Sixth Cavalry (2 troops)	7	.....	90
Eighth Cavalry (2 troops)	9	.....	67
Tenth Cavalry	53	4	328
Second Infantry	16	3	173
Third Infantry	27	5	253
Twenty-fifth Infantry	30	2	256
Recruits unassigned (mounted)	1	.....	.....
Out of department	4	.....	.....
Total	150	15	1,176

Table affording a comparison of the number of trials and the percentage as to the enlisted strength for the years 1895–96 and 1896–97.

Years.	Trials by general courts-martial.	Per cent.	Trials by inferior courts.	Per cent.
1895–96	[1] 145	5.5	1,299	49.6
1896–97	[1] 146	6.1	1,191	50.3

[1] Cases pertaining to organizations outside of department are not included in figures or percentage.

Number of men charged with desertion, returned to duty without trial 1

Number of men dishonorably discharged by sentence of general courts-martial.

For desertion 9
Through use of previous convictions 16
For serious offenses where previous convictions could not be considered 35

Total 60

DESERTIONS.

From the special reports of boards of survey upon desertions received and filed in this office the following data has been obtained:

Total number of desertions 69

Posts and organizations from which the men deserted.

Posts.	Number.	Organizations.	Number.
Fort Assinniboine, Mont	15	Sixth Cavalry (2 troops)	5
Fort Custer, Mont	2	Eighth Cavalry (2 troops)	8
Fort Harrison, Mont	1	Tenth Cavalry	13
Fort Keogh, Mont	12	Second Infantry	12
Fort Missoula, Mont	6	Third Infantry	19
Fort Snelling, Minn	19	Twenty-fifth Infantry	12
Fort Yates, N. Dak	9		
Fort Yellowstone, Wyo	5	Total	69
Total	69		

Place of enlistment.

St. Paul, Minn 10
Minneapolis, Minn 3
At posts in department 11
Outside of department 45

Total 69

Length in service at time of desertion.

Less than three months	9
Three to six months	13
Six to twelve months	12
One to two years	15
Two to three years	4
Three to four years	5
Four to five years	2
Five years and over	9
Total	69

Condition as to sobriety when last seen.

Drunk	1
Under the influence of liquor	7
Sober	61
Total	69

Number of trials previous to desertion.

Once	14
Twice	9
Three times	5
Four times	..
Five times	5
Six times or over	6
Never tried	30
Total	69

Character as given by troop or company commanders.

Excellent	2
Very good	1
Good	17
Fair	21
Indifferent	9
Poor	6
Bad	6
Worthless	7
Total	69

Moneys due, and to whom, at time of desertion.

To the United States	$836.16
To the soldier	589.77

Preparation made before departure.

Took all belonging to them	10
Took part only	28
Sold everything	9
Unknown	22
Total	69

Percentage of desertions to enlisted strength for the years indicated.

Years.	Average enlisted strength.	Number of desertions.	Per cent. of enlisted strength.
1894–95	3,284	138	4.07
1895–96	2,617	120	4.58
1896–97	2,365	69	2.91

Opinions given in reports as bearing upon the causes of desertions.

Fear of punishment for neglect of duty	3
Deeply in debt	2
Mind unbalanced	3
Theft, fear of punishment	3
Fraudulent enlistment, fear of trial	1
Roving and restless disposition	2
Enlisted for transportation	1
Influenced by relatives and others	3
Supposed repeaters	1
Applied for transfer to cavalry and thought it was disapproved	1
General dissatisfaction	2
General worthlessness	3
Absolute fear of a horse	1
Fear of arrest by civil authorities for theft off of reservation	1
Escaped from civil authorities (held for assault with intent to kill)	1
Unknown	31
Total	69

While the statistics show an increased percentage of trials this year over last, they also show the desertions to be almost 50 per cent. less.

In my opinion the interests of the service would be subserved if 20 general prisoners could be provided for at Fort Harrison, Mont. Such provision would prevent the overcrowding of the guardhouse at Fort Snelling, and save much of the expense that is now incurred for the transportation of prisoners.

Respectfully submitted.

EDWARD HUNTER,
Deputy Judge-Advocate-General, U. S. A., Judge-Advocate.

REPORT OF MAJ. S. W. GROESBECK, JUDGE-ADVOCATE UNITED STATES ARMY, JUDGE-ADVOCATE, DEPARTMENT OF CALIFORNIA.

HEADQUARTERS DEPARTMENT OF CALIFORNIA,
OFFICE OF JUDGE-ADVOCATE,
San Francisco, Cal., September 7, 1897.

The JUDGE-ADVOCATE-GENERAL, UNITED STATES ARMY,
Washington, D. C.

SIR: I have the honor to submit the following report of the business of this office from September 1, 1896, to and inclusive of August 31, current year:

GENERAL COURTS-MARTIAL.

Number of sets of charges received for trial by general courts-martial 78

Of this number, 4 were returned for trial by inferior court; 3 were not recommended for trial; in 1 case the accused deserted, and 2 are awaiting trial.

Number of trials by general courts-martial	68
Acquittals	2

The offenses for which these men were tried are classified as follows:

Thirty-second article of war:	
Absence without leave	16
Thirty-third article of war:	
Failure to attend roll call	1
Thirty-eighth article of war:	
Drunkenness on duty	5
Thirty-ninth article of war:	
Sleeping on post	5
Fortieth article of war:	
Quitting guard	2

Forty-seventh article of war:	
Desertion	[1]10
Sixty-second article of war:	
Assault	1
Breach of arrest	2
Disobeying commissioned officer	2
Disobeying noncommissioned officer	5
Disorderly conduct	1
Drunkenness	5
Drunk and disorderly	3
False accusation against a noncommissioned officer	1
False swearing	1
Fraudulent enlistment	3
Neglect of duty	4
Purchasing uniform clothing from a comrade	1

Summary of punishments imposed by general courts-martial.

Amount of forfeitures (in some cases with confinement)	$809
Dishonorably discharged with forfeiture of pay and allowances	13
Dishonorably discharged with forfeitures and confinement	16

Of the foregoing number of men shown as dishonorably discharged, 19 were upon citation of previous convictions.

INFERIOR COURTS-MARTIAL.

Number of trials by inferior courts-martial:	
By summary court	955
By garrison court-martial	18
Total	973
Acquittals	29

The offenses for which these men were tried are classified as follows:

Thirty-second article of war:	
Absence without leave	331
Thirty-third article of war:	
Failure to attend drills, stables, parades, roll calls	254
Thirty-eighth article of war:	
Drunkenness on duty	56
Thirty-ninth article of war:	
Sleeping on post	1
Fortieth article of war:	
Quitting guard	7
Sixty-second article of war:	
Abusive, threatening, or obscene language	38
Abusing public animals	2
Allowing prisoner to escape	1
Assault	7
Disobeying noncommissioned officer	50
Disorderly conduct	6
Drunkenness	49
Drunk and disorderly	32
Fighting and other disturbances	21
Gambling	2
Neglect of duty	88
Minor offenses (not included under previous heads)	28

Summary of punishments imposed by inferior courts-martial.

Amount of forfeitures	$2,955.25
Number of days' confinement	1,380

[1] Includes six deserters from organizations in other departments.

Distribution of trials by general courts-martial.

Organization.	Band.	A.	B.	C.	D.	E.	F.	G.	H.	I.	K.	L.	M.	Det.	Total.
Signal Corps														1	1
Hospital Corps														2	2
Fourth Cavalry			2	3						5	2				12
Third Artillery		1		5		3	1	2	2	1		1			16
Fifth Artillery	1			1	2	2				3		3			12
First Infantry	1		2	7	4	1	2	1	1						19
Fourteenth Infantry		a1	a1				a1								3
Sixteenth Infantry									a1						1
Seventeenth Infantry					a1										1
General Mounted Service														a1	1
Total															68

a Deserters from other departments.

Number of men tried once, and more than once.

	Men.	Trials.
Tried once	56	56
Tried twice	6	12
Total	62	68

Distribution of trials by inferior courts-martial.

Organization.	Band.	A.	B.	C.	D.	E.	F.	G.	H.	I.	K.	L.	M.	Det.	Total.
Hospital Corps														9	9
Fourth Cavalry			27	36						42	74				179
Third Artillery	6	67		25	35	43	32	20	25	24	43	34			354
Fifth Artillery		10	2	22	12	10	14			9	11	13	13		116
First Infantry	6	21	34	29	50	48	55	47	25						315
Total															973

Number of men tried once, and more than once.

	Men.	Trials.
Tried once	465	465
Tried twice	137	274
Tried three times	45	135
Tried four times	14	56
Tried five times	5	25
Tried six times	3	18
Total	669	973

A comparison with preceding year is submitted, as follows:

1895-1896.

Average enlisted strength of the department 1,373

From September 1, 1895, to and inclusive of August 31, 1896, excluding deserters from organizations in other military departments, the total number of trials was 1,035 (99 by general court, 936 by inferior court), embracing only 777 different enlisted men, or 56.59 per cent. of the enlisted strength of the department.

1896-1897.

Average enlisted strength of the department 1,480

From September 1, 1896, to and inclusive of August 31, 1897, excluding deserters from organizations in other military departments, the total number of trials was

1,035 (62 by general court, 973 by inferior court), embracing only 725 different enlisted men, or 48.98 per cent. of the enlisted strength of the department.

Excluding deserters from other departments, tried and sentenced here, the number of men dishonorably discharged during the last four years in Department of California is as follows:

	On previous convictions.	Without such convictions.
September 1, 1893–August 31, 1894	21	31
September 1, 1894–August 31, 1895	22	4
September 1, 1895–August 31, 1896	25	11
September 1, 1896–August 31, 1897	19	4
Total	87	50

The elimination of 87 troublesome characters, upon citation of previous convictions, explains in part the gratifying reduction in the number of trials by general courts-martial for the twelve months just closed. Assuming each man of the 87 to represent the minimum of six trials, they have added a total of 522 trials to the record during the time they were in service. But, in fact, the total number is greater—closely approximating 600 trials. The facts cited indicate that the law by which it has been made practicable to discharge these men has not yet reached its full efficacy in its working for the good of the service.

The law referred to, the method of detecting the fraudulent enlistment of old offenders, and the increased care exercised in making enlistments, are the three factors which have, in the recent past, most efficiently operated to improve the moral status and discipline of the enlisted men.

Very respectfully,

S. W. GROESBECK,
Judge-Advocate, United States Army.

REPORT OF MAJ. E. H. CROWDER, JUDGE-ADVOCATE UNITED STATES ARMY, JUDGE-ADVOCATE, DEPARTMENT OF THE PLATTE.

HEADQUARTERS DEPARTMENT OF THE PLATTE,
JUDGE-ADVOCATE'S OFFICE,
Omaha, Nebr., September 10, 1897.

The JUDGE-ADVOCATE-GENERAL, UNITED STATES ARMY,
Washington, D. C.

SIR: Under the requirements of paragraph 891, Army Regulations, I have the honor to submit the following report of the business of this office for the period commencing September 1, 1896, and ending August 31, 1897:

GENERAL COURTS-MARTIAL.

During the period named 156 sets of charges were received, of which number 133 were tried by general courts-martial; 3 recommended for trial by summary court; 4 recommended for trial in other departments; 7 withdrawn; 2 discharged before trial; 1 restored to duty without trial; 1 turned over to the civil authorities for trial; 5 pending.

The cases tried include—

Noncommissioned officers	10
Privates, etc	123
Total	133

Of these trials, 19 resulted in acquittal; in one case the sentence was disapproved, and 6 were of men belonging to other departments.

The offenses tried include violations of the following Articles of War:

Seventeenth article of war:	
Selling	2
Losing	5

Twentieth article of war:	
Disrespect to commanding officer	5
Twenty-first article of war:	
Disobeying superior officer	12
Thirty-second article of war:	
Absence without leave	19
Thirty-third article of war:	
Failure to attend drill, roll call, etc	12
Thirty-eighth article of war:	
Drunk on guard	2
Drunk on other duty	2
Thirty-ninth article of war:	
Quitting post	7
Sleeping on post	2
Fortieth article of war:	
Quitting guard	1
Leaving ranks	1
Forty-seventh article of war:	
Desertion	22
Sixty-second article of war:	
Assault	9
Assault with intent to kill	2
Assault with dangerous or deadly weapon	4
Assault with intent to do bodily injury	2
Breach of arrest	8
Committing nuisance	1
Destroying private property	2
Disobeying noncommissioned officer	30
Disobedience of post or company orders	7
Disrespect to sentinel	1
Drunk and disorderly in post or quarters	5
Drunk in quarters	3
Drunk and disorderly, causing arrest by civil authorities	1
Drunkenness	3
Embezzlement	1
False report	1
False statement	7
Forgery	1
Fraudulent enlistment	6
Insubordinate and disrespectful language or manner to noncommissioned officer	13
Larceny	11
Lying	1
Neglect of duty	8
Perjury	1
Resisting arrest	2
Setting fire to public building	1
Subornation of perjury	1
Suffering prisoners to escape	2
Conduct to the prejudice of good order and military discipline not included under previous headings	36

The following table shows the apportionment of the cases tried by general courts-martial among the different organizations, with the record for the same period last year:

Organizations.	1896-97.	1895-96.	Organizations.	1896-97.	1895-96.
First Infantry	1	.....	Second Cavalry	.....	1
Second Infantry	.....	57	Eighth Cavalry	9	13
Seventh Infantry	2	.....	Ninth Cavalry	20	10
Eighth Infantry	58	33	Fourth Artillery	1	.....
Twelfth Infantry	11	12	Hospital Corps	.....	1
Fifteenth Infantry	.....	1	Indian scout	1	.....
Sixteenth Infantry	.....	1	Noncommissioned staff	.....	1
Twenty-second Infantry	28	2			
First Cavalry	2	1	Total	133	113

The following table affords a comparison as to the average enlisted strength of the department and the number of trials by general courts-martial, with percentage of latter to former, for each of the five years last past:

Year.	Average enlisted strength.	Trials by general courts-martial.	Percentage.	Year.	Average enlisted strength.	Trials by general courts-martial.	Percentage.
1892–93	3,539	307	8.6	1895–96	2,523	113	4.4
1893–94	2,740	248	9.0	1896–97	2,586	133	5.1
1894–95	2,116	191	9.0				

These records have all been examined in this office, the decisions and orders of the department commander indorsed thereon, promulgated in orders, and forwarded to the office of the Judge-Advocate General of the Army.

INFERIOR COURTS.

Garrison courts-martial.

During the period covered by this report there were 46 trials by garrison courts-martial. The records of these trials have been received, revised, and filed in this office. Of the total number of trials by garrison courts-martial 12 resulted in acquittal, and in 2 cases the findings were disapproved.

These trials include violations of the following articles of war—

Thirty-second article of war:
- Absence without leave 6

Thirty-third article of war:
- Failure to attend drill, roll call, etc 2

Thirty-eighth article of war:
- Drunk at guard mount 1
- Drunk at drill 2

Sixty-second article of war:
- Assault 1
- Disorderly conduct in post or quarters 1
- Disobeying noncommissioned officer 4
- Disobeying regimental orders 1
- Drunk in quarters 3
- Drunkenness 1
- False statement 2
- Insubordinate and direspectful language or manner to noncommissioned officer 5
- Insubordinate conduct to officer 1
- Neglect of duty 5
- Neglect of duty (sentinel) 1
- Conduct to the prejudice of good order and military discipline not included under previous headings 20

The following table shows the apportionment of the cases tried by garrison courts-martial among the different organizations with the record for the same period last year:

Organizations.	1896–97.	1895–96.	Organizations.	1896–97.	1895–96.
Second Infantry	.....	1	Ninth Cavalry	2	3
Eighth Infantry	34	33	Twenty-Second Infantry	9	3
Twelfth Infantry	.....	2	Hospital Corps	1	.....
Seventeenth Infantry	.....	3			
Eighth Cavalry	.....	.....	Total	46	45

The following table affords a comparison as to the average enlisted strength of the department and the number and percentage of trials by garrison courts-martial, with the number and percentage of men tried, during the five years last past:

Year.	Average enlisted strength.	Trials by garrison courts-martial.		Men tried.	
		Number.	Per cent.	Number.	Per cent.
1892–93	3,539	43	1.2	42	1.1
1893–94	2,740	46	1.6	46	1.6
1894–95	2,116	47	2.2	41	1.9
1895–96	2,523	45	1.7	39	1.5
1896–97	2,586	46	1.7	43	1.6

SUMMARY COURTS.

During the period covered by this report there were 1,236 trials by summary courts. The monthly transcripts of these trials have been received, examined, and filed in this office. Of the total number of trials by summary courts, 34 resulted in acquittal. In one case the sentence was set aside as illegal.

These trials include violations of the following articles of war:

Seventeenth article of war	2
Thirty-first article of war	1
Thirty-second article of war	257
Thirty-third article of war	490
Thirty-eighth article of war	50
Fortieth article of war	1
Sixtieth article of war	1
Sixty-second article of war:	
Absences not charged under thirty-second or thirty-third	60
Assault	18
Abusing horse	5
Breach of arrest	13
Committing nuisance	18
Dirty gun, clothing, etc	32
Disrespectful and insubordinate language or manner to noncommissioned officer	80
Disobeying noncommissioned officer	76
Disobeying post or company orders	32
Disrespectful language or manner to superior officer	5
Drunkenness	58
Drunkenness, etc., causing arrest by civil authorities	4
Drunk and disorderly at post or in quarters	50
Drunk and disorderly in city	6
False report (noncommissioned officer)	3
False statement	18
Introducing liquor into post	3
Neglect of duty	39
Neglect of duty (sentinel)	13
Resisting arrest	2
Disorders, etc., charged as "conduct to the prejudice of good order and military discipline," not included under previous headings	136

The following table shows the apportionment of the cases tried by summary courts among the different organizations, with the record for the same period last year:

Organizations.	1896–97.	1895–96.	Organizations.	1896–97.	1895–96.
Second Infantry	.....	233	Eighth Cavalry	205	246
Eighth Infantry	220	274	Ninth Cavalry	380	249
Twelfth Infantry	153	142	Hospital Corps	22	9
Seventeenth Infantry	.....	4			
Twenty-second Infantry	248	44	Total	1,236	1,201
Sixth Cavalry	8	.....			

The following table exhibits the number of cases tried by summary courts at the several posts in the department during the years 1895–96 and 1896–97:

Posts.	1896–97.	1895–96.	Posts.	1896–97.	1895–96.
Fort Crook	252	45	Fort D. A. Russell	218	264
Fort Meade	211	248	Fort Washakie	74	50
Fort Niobrara	155	145	Camp Pilot Butte	5	8
Fort Omaha		235			
Fort Robinson	321	206	Total	1,236	1,201

The following table shows the average enlisted strength of the department, the number and percentage of trials by summary court, and the number and percentage of men tried, during the five years last past:

Year.	Average enlisted strength.	Trials by summary court.		Men tried.	
		Number.	Per cent.	Number.	Per cent.
1892–93	3,539	1,736	49.0	1,043	29.4
1893–94	2,740	1,729	63.1	977	35.6
1894–95	2,116	1,327	62.7	791	37.3
1895–96	2,523	1,201	47.6	772	30.5
1896–97	2,586	1,236	47.7	869	33.6

The following table shows the average enlisted strength of the department, the number and percentage of trials of enlisted men by both general and inferior courts-martial, during the period covered by this report, together with the record for the same period last year:

Year.	Average strength.	General.		Garrison.		Summary.	
		Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
1895–96	2,523	113	4.4	45	1.7	1,201	47.6
1896–97	2,586	133	5.1	46	1.7	1,236	47.7

The percentages of trials by the different courts-martial for the year 1895–96, set forth above, were the lowest theretofore reported from this department since the institution of the summary court. The report this year exhibits but slight increases over the percentages of last year, thus showing that the favorable record of the department as to trials by courts-martial last year has been substantially repeated this year.

The following table exhibits a comparison in respect of posts of approximately the same enlisted strength as to the number of appeals from summary to garrison court:

Appeals from summary to garrison courts-martial.

Post.	1894–95.	1895–96.	1896–97.	Total.
Fort Meade	0	0	0	0
Fort Niobrara	3	2	0	5
Fort Robinson	0	0	1	1
Fort D. A. Russell	36	33	34	103
Fort Crook		3	11	14

These statistics indicate that the summary court continues to meet with general approval in this department, although considerable local dissatisfaction seems to exist at Fort D. A. Russell, the cause for which is not apparent.

Very respectfully,

E. H. CROWDER,
Major and Judge-Advocate, United States Army.

REPORT OF CAPT. EDWIN F. GLENN, ACTING JUDGE-ADVOCATE, DEPARTMENT OF THE COLUMBIA.

HEADQUARTERS DEPARTMENT OF THE COLUMBIA,
JUDGE-ADVOCATE'S OFFICE,
Vancouver Barracks, Wash., September 11, 1897.

The JUDGE-ADVOCATE-GENERAL, UNITED STATES ARMY,
Washington, D. C.

SIR: Pursuant to the requirements of paragraph 891, Army Regulations, I have the honor to submit the following report of the trials of officers and enlisted men in this department during the year ending August 31, 1897. These trials are classified as directed in said paragraph and the acquittals noted as directed:

GENERAL COURTS-MARTIAL.

Number of general court-martial records received, revised, recorded, and forwarded to the Judge-Advocate-General during the year ending August 31, 1897, sixty-one cases of enlisted men:

Convictions	57
Acquittals	4
Total cases	61

Comparison of total number with that of two previous years.

Cases tried 1894–95	72
Cases tried 1895–96	65
Cases tried 1896–97	61
Decrease from last year	4

	Cases.
53 men tried once	53
4 men tried twice	8
57 men tried, with a total of	61

One commissioned officer of the Fourteenth Infantry tried and dismissed during the year.

Distribution of cases tried by general courts among the different military posts in the department.

Post.	Cases tried at post.	Of men belonging to post.	Of men belonging to other posts.	Of men belonging to other departments.	Men of post tried at other posts.	Total number of men of post tried.	Average strength of garrison.	Per cent.	Per cent. last year.
Boise Barracks	.....	.....	.....	.....	3	3	125	2.4	2.5
Fort Canby	.....	.....	.....	.....	.....	.....	69	.....	6.6
Fort Sherman	13	8	5	.....	1	9	332	2.7	6.4
Fort Spokane	.....	.....	.....	.....	5	5	150	3.3	1.6
Vancouver Barracks	30	22	2	6	.....	22	585	3.8	3.4
Fort Walla Walla	18	14	3	1	1	15	244	6.1	4.1
Total and average	61	44	10	7	10	54	1,505	3.6	4.0

Number of convictions of different offenses tried by general courts in the department during the year ending August 31, 1897.

Seventeenth article of war:	
Selling clothing	2
Twenty-first article of war:	
Disobeying superior officer	1
Thirty-second article of war:	
Absence without leave	11

Thirty-third article of war:
Failure to attend drill, roll call, etc. 5
Thirty-eighth article of war:
Drunkenness on duty 10
Thirty-ninth article of war:
Quitting post 2
Sleeping on post 2
Forty-seventh article of war:
Desertion 15
Sixty-second article of war:
Allowing prisoner to obtain liquor 1
Assault and battery 1
Assault with a dangerous weapon 1
Breach of arrest 2
Committing a nuisance 1
Destroying soldier's handbook 1
Disregard of orders 2
Drunkenness 6
Fraudulent enlistment 5
Larceny 3
Lying 1
Neglect of duty 1
Resisting arrest 1
Striking noncommissioned officer 1
Suffering a prisoner to escape 1
Threatening to strike noncommissioned officer 1
Using foul and profane language 2
Using insulting and threatening language 4

Comparison of number of cases tried for desertion with that of previous year.

Number of convictions of desertion 15
Convicted of "absence without leave," charge "desertion" 2

Number of cases tried for desertion, 1896–97 17
Number tried last year 20

Decrease 3

Number of men dishonorably discharged 32
Same, last year 38
Number of men dishonorably discharged for minor offenses on account of previous convictions (included in above) 9
Same, last year 9
Number of trials in which evidence of previous convictions was introduced 17
Same, last year 21
Number of noncommissioned officers reduced to the ranks 3

Table exhibiting the organization to which the enlisted men tried by general courts belong.

Organization.	Band.	A.	B.	C.	D.	E.	F.	G.	H.	L.	M.	Total.
Second Cavalry				1								1
Fourth Cavalry		3	1		2	2	3	3	5			19
Fifth Artillery									1			1
Fourth Infantry			1			1						2
Eighth Infantry							1					1
Fourteenth Infantry		5	1	2	1	2	3	2	2			18
Sixteenth Infantry			3	3	4	1			2			13
Nineteenth Infantry			1									1
Twenty-fifth Infantry								1				1
Total												57

Again there is a small decrease in the number of trials by general courts-martial during the year, and it is worthy of note that there has been a decrease in the number of such trials each year over the preceding year since 1890, or as far back as the records of this office can be accurately traced. The offenses committed have been essentially military in their nature as contradistinguished from crimes and misdemeanors. The three cases of larceny would properly be classed as petit larceny in any jurisdiction.

INFERIOR COURTS-MARTIAL.

Garrison courts-martial.

Number of cases tried by garrison courts-martial during the year ending August 31, 1897	20
Number of men tried	20
Convictions	17
Acquittals	3
Total cases	20

Summary courts.

Number of cases tried by summary courts during the year ending August 31, 1897	746
Number of men tried	463
Convictions	728
Acquittals	18
Total cases	746
Noncommissioned officers reduced to the ranks by sentence of inferior court	9
Forfeitures imposed and executed	$2,653
Number of days confinement at hard labor	2,235
Number of days solitary confinement	4
Number of days solitary confinement on bread and water diet	66
Number of days confinement to limits of quarters except when on duty	60

Distribution of cases tried by inferior courts, with number confined and released without trial, at the posts in the department.

Post.	Average strength of garrison.	Cases tried.		Men tried.		Confined and released without trial.
		Summary.	Garrison.	Number.	Per cent.	
Boise Barracks	125	98	8	55	44.0	1
Fort Canby	69	19	.....	14	20.3	.....
Fort Sherman	332	192	.....	115	34.6	.....
Fort Spokane	150	88	2	56	37.3	2
Vancouver Barracks	585	207	9	143	24.4	4
Fort Walla Walla	244	142	1	92	37.7	.....
Total and average	1,505	746	20	*a* 475	31.6	7

a Eight men tried by both summary and garrison courts.

Distribution of cases and men tried by inferior courts among the different organizations serving in the department.

Organization.	Trials.	Band.	A.	B.	C.	D.	E.	F.	G.	H.	L.	M.	Total.
Fourth Cavalry	Cases	15	32	....	....	21	22	38	33	38	....	....	199
	Men	13	21	....	....	14	17	22	21	20	....	....	128
Third Artillery *a*	Cases	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	18
	Men	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13	13
Fifth Artillery *b*	Cases	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
	Men	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	1
Fourth Infantry *c*	Cases	1	5	4	3	....	....	6	2	....	....	....	21
	Men	1	4	3	2	....	....	5	2	....	....	....	17
Fourteenth Infantry	Cases	5	15	24	17	32	24	23	21	33	....	....	194
	Men	1	10	13	14	19	15	20	16	18	....	....	126
Sixteenth Infantry *d*	Cases	1	63	40	49	39	50	29	26	30	....	....	327
	Men	1	30	24	24	22	32	19	18	16	....	....	186
Hospital Corps	Cases	.....	....	....	....	....	....	....	....	....	....	....	6
	Men	.....	....	....	....	....	....	....	....	....	....	....	4
Total	Cases	.....	....	....	....	....	....	....	....	....	....	....	766
	Men	.....	....	....	....	....	....	....	....	....	....	....	475

a Entered department October 23, 1896.
b Left department October 9, 1896.
c Left department October 11, 1896.
d Entered department October 12, 1896.

NOTE.—Troops, batteries, and companies, except Companies D, E, and H, Fourth Infantry, showing no trials in above table are not serving in the department.

Number of times tried by inferior courts.

	Cases.
287 men tried once	287
120 men tried twice	240
47 men tried three times	141
12 men tried four times	48
6 men tried five times	30
2 men tried six times	12
1 man tried eight times	8
475 men tried with a total of	766
Number of cases tried by inferior courts	766
Number tried last year	642
Increase	124

Classification of offenses tried by inferior courts.

Spoiling accoutrements (laid under seventeenth article)	1
Losing clothing (laid under seventeenth article)	1
Lying out of quarters (laid under thirty-first article)	13
Absence without leave (laid under thirty-second article)	130
Absence from drill, roll call, etc. (laid under thirty-third article)	300
Drunkenness on duty (laid under thirty-eighth article)	48
Disorders charged as "conduct to the prejudice of good order and military discipline" (laid under sixty-second article)	343
Total number of offenses	836

That the garrison court was resorted to by twenty men during the year shows simply that this court continues to serve certain useful purposes. The percentage of acquittals by this court being twice as great as by the summary court does not necessarily indicate that more even justice is meted out. Nor does this fact account for the increase in the number of men tried by this court, which is accounted for in part by other causes. Inquiry develops the fact that certain changes in the summary court officer caused a number of men to ask for trial by garrison court.

The foregoing tables contain the usual data and from them can be drawn such inferences as to the discipline of the different organizations and garrisons in this department as such information will admit of. The percentage of trials at one or two of the smaller garrisons seems unnecessarily large, particularly at Boise Barracks, Idaho. Attention is invited to the fact that there is an increase of about one-sixth in the number of trials by this court in this department.

DESERTIONS.

Number of desertions during the year ending August 31, 1897	62
Number reported last year	89
Decrease	27

Causes, etc., of desertions, ascertained under the provisions of paragraph 115, Army Regulations, and comparison of same data for three preceding years.

Year.	Character as set forth in reports of boards of survey.						Causes of desertion—opinions given in reports of boards of survey.													Nativity.	
	Excellent.	Good.	Fair.	Bad.	Worthless.	Not formed.	Not ascertained.	Dissatisfaction with service.	Infatuation for woman.	Debts, unable to pay.	To join brother in expedition to Africa.	Restless temperament.	To join revenue service.	Worthlessness.	Chronic deserter.	Coming into money.	To escape court-martial.	Drink.	Fear of horses.	Persuaded by other deserter.	Not included under preceding heads.	American.	Foreign.
1896–97	6	31	14	6	4	1	27	11	2	3	1	3	2	5	2	1	2	1	1	1	....	48	14
1895–96	3	55	17	5	4	5	44	7	1	11	....	2	....	....	....	....	8	4	....	....	12	74	15
1894–95	3	44	12	9	3	3	37	10	....	10	....	....	....	....	....	....	3	4	....	....	10	57	17
1893–94	2	27	10	5	2	1	25	4	....	7	....	....	....	....	....	....	4	....	....	....	7	32	15

Year.	Number tried by courts-martial and number of trials.				Length of service.							Months in which desertions occurred.											
		Inferior courts.										1896.					1897.						
	General courts.	Tried once.	Tried more than once.	Not tried.	Less than 6 months.	Between 6 months and 1 year.	Between 1 and 2 years.	Between 2 and 3 years.	Between 3 and 4 years.	Between 4 and 5 years.	Over 5 years' service.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.
1896–97...	1	10	20	32	14	24	10	2	1	4	7	2	5	5	4	3	...	2	6	9	5	5	9	7
1895–96...	4	14	17	57	....	38	19	5	7	5	15	3	4	6	6	3	4	10	14	8	4	6	12	9
1894–95...	6	11	20	41	....	32	18	4	3	5	12	9	6	7	2	1	2	4	4	11	4	10	7	7
1893–94...	2	13	11	22	....	21	15	3	1	2	5	3	3	5	2	6	1	1	1	5	5	8	3	4

Distribution of cases of desertion among the different military posts in the department.

Post.	Average strength of garrison.	Number of desertions.	Per cent.	Per cent. last year.
Boise Barracks	125	11	8.8	5.0
Fort Canby	69	3	4.3	5.8
Fort Sherman	332	14	4.2	12.1
Fort Spokane	150	5	3.3	1.1
Vancouver Barracks	585	21	3.6	5.5
Fort Walla Walla	244	8	3.3	3.3
Total and average	1,505	62	4.1	5.8

Distribution of cases of desertion among the different organizations serving in the department.

Organization.	Band.	A.	B.	C.	D.	E.	F.	G.	H.	L.	M.	Total.	Average strength of organization.	Per cent.
Fourth Cavalry	.....	4	(a)	(a)	1	....	4	2	1	....	....	12	345	3.5
Third Artillery	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	1	1	63	1.6
Fifth Artillery	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)	2	(a)	(a)	2	58	3.4
Fourth Infantry	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	1	499	.2
Fourteenth Infantry	.....	6	2	1	6	1	2	2	1	....	....	21	516	4.1
Sixteenth Infantry	1	6	2	....	4	3	3	4	2	....	....	25	533	4.7
Hospital Corps	.....	....	....	....	....	....	....	....	....	....	.....	.....	17	.....

a Not serving in the department.

NOTE.—Battery M, Third Artillery, entered department in October, 1896, and Battery H, Fifth Artillery, left department same month. The Fourth Infantry left department in October, 1896, and the Sixteenth Infantry entered department same month.

The number of desertions is about the average for the past six or eight years. The alleged causes are given in the tables.

Very respectfully, your obedient servant,

EDWIN F. GLENN,
Captain and Acting Judge-Advocate.

REPORT OF CAPT. FRANK L. DODDS, ACTING JUDGE-ADVOCATE, DEPARTMENT OF TEXAS.

HEADQUARTERS DEPARTMENT OF TEXAS,
JUDGE-ADVOCATE'S OFFICE,
San Antonio, September 10, 1897.

The JUDGE-ADVOCATE-GENERAL, UNITED STATES ARMY,
Washington, D. C.

SIR: I have the honor to submit the following report of the business of this office for the year ending August 31, 1897:

There were no commissioned officers tried.

The following table shows the number of general, garrison, and summary courts-martial cases tried at the several posts in the department, with the percentage of trials:

Post.	Average enlisted strength of garrison.	Number and percentage of trials.					
		General cases tried.	Percentage of general cases tried.	Garrison cases tried.	Summary cases tried.	Total inferior cases tried.	Percentage of inferior cases tried.
Headquarters Department of Texas	6						
Fort Bliss	214	9	4.21	1	76	77	35.98
Fort Brown	126	9	7.14	2	77	79	62.70
Fort Clark	398	35	8.79	4	191	195	48.99
Camp Eagle Pass	63				31	31	49.21
Fort McIntosh	128	5	3.91	1	44	45	35.16
Fort Ringgold	146	1	.68	2	124	126	86.30
Fort Sam Houston	719	27	3.76	3	282	285	39.64
Total	1,800	86	4.78	13	825	838	46.56
Convictions		72		10	794	804	
Acquittals		14		3	31	34	

There were 532 different enlisted men tried by inferior courts-martial.

The different offenses tried by general courts-martial were as follows:

Nature of offense.	Article of war violated.	Cases tried.
Losing Government property	Seventeenth	2
Disrespect toward commanding officer	Twentieth	2
Absence without leave	Thirty-second	11
Failure to attend drill, roll call, etc	Thirty-third	9
Drunkenness on duty	Thirty-eighth	10
Quitting post	Thirty-ninth	4
Sleeping on post	do	1
Quitting guard	Fortieth	1
Desertion	Forty-seventh	8
Absence without leave not chargeable under thirty-second article of war	Sixty-second	2
Allowing prisoner to escape	do	3
Assault upon a noncommissioned officer	do	2
Assault with deadly weapon	do	4
Breach of arrest	do	3
Challenging to fight	do	1
Conduct to the prejudice of good order and military discipline	do	13
Creating a disturbance in post or quarters	do	4
Disobeying the orders of a noncommissioned officer	do	12
Disorderly conduct in post or quarters	do	3
Disrespect toward commissioned officer	do	1
Drunkenness in post or quarters	do	5
Failing to report the intended desertion of a soldier	do	1
False marking at target practice	do	1
False swearing	do	1
Felonious assault upon a noncommissioned officer	do	2
Felonious assault upon a fellow-soldier	do	1
Fighting	do	2
Fraudulent enlistment	do	2
Furnishing money to a soldier about to desert	do	1
Insubordinate conduct toward commissioned officer	do	1
Insubordinate language toward commissioned officer	do	1
Larceny	do	4
Losing Government property	do	2
Lying or making false statement	do	2
Prisoner refusing to obey the orders of a sentinel	do	1
Prisoner refusing to work	do	1
Provoking a quarrel	do	1
Resisting arrest	do	3
Resisting and striking a noncommissioned officer	do	1
Threatening and attacking a fellow-soldier	do	1
Sentinel disobeying the orders of the sergeant of the guard	do	1
Sentinel sitting down on post	do	1
Unlawfully disposing of uniform clothing	do	2
Using insubordinate, profane, filthy, or abusive language	do	10

The total of cases tried is distributed among organizations as follows:

Regiment or corps.	General trials.	Inferior trials.	
		Garrison.	Summary.
Hospital Corps	1	1	9
Fifth Cavalry	36	8	305
First Artillery	1	1	23
Second Artillery	2	.....	.....
Third Artillery	.....	.....	2
Fourth Infantry	.....	.....	1
Eighteenth Infantry	14	1	211
Twenty-third Infantry	32	2	259
Indian scouts	.....	.....	15
Total	86	13	825

The following table affords comparisons as to average enlisted strength of the department, and number and percentage of trials for the periods stated:

Year.	Average enlisted strength.	Trials by courts-martial.		Percentage of trials.	
		General.	Inferior.	General.	Inferior.
1896	1,803	106	864	5.88	47.92
1897	1,800	86	838	4.78	46.56

My annual report to the department commander for the past fiscal year upon the subject of desertions is made an appendix hereto.

Respectfully submitted.

FRANK L. DODDS,
Captain and Acting Judge-Advocate.

APPENDIX.

HEADQUARTERS DEPARTMENT OF TEXAS,
JUDGE-ADVOCATE'S OFFICE,
San Antonio, July 24, 1897.

The ADJUTANT-GENERAL, DEPARTMENT OF TEXAS.

SIR: I have the honor to submit, for the information of the department commander, in accordance with paragraph 116, Army Regulations, the following report of desertions within this department for the preceding fiscal year:

American born	52
Foreign born	9
Total	61

Of these, 31 enlisted outside of the department, and 30 in the department.

Causes of desertion, taken from the separate special reports rendered in each case.

Cavalryman, afraid of a horse	1
Debts	4
Discontent resulting from compulsory marriage	1
Dissatisfied on account of isolation of station	1
Dissatisfied with the service	6
Drink and debt	1
Fear of punishment for offenses committed	4
General worthlessness	3
Roving disposition	1
To take possession of property inherited in Germany	1
To avoid arrest by civil authorities	2
To escape consequences of imprudent marriage	1
To join baseball club in Mexico	1

To join Cuban insurgents	1
To join wife	2
Trouble with a woman	1
Weak-mindedness	3
Unknown causes	27
Total	61

19 had served one day to six months.
6 had served six months to one year.
16 had served one year to two years.
4 had served two years to three years.
3 had served three years to four years.
5 had served four years to five years.
8 had served over five years.

61

The following table gives the posts and organizations from which the men deserted:

Posts.	Number.	Regiment or corps.	Number.
Fort Bliss	14	Hospital Corps	1
Fort Brown	7	Fifth Cavalry	28
Fort Clark	7	First Artillery	1
Camp Eagle Pass	2	Eighteenth Infantry	16
Fort McIntosh	4	Twenty-third Infantry	13
Fort Ringgold	2	Total	61
Fort Sam Houston	25		
Total	61		

The following table exhibits the character and rank of these deserters:

Character.	Number.	Rank.	Number.
Excellent	8	Corporals	1
Very good	8	Blacksmiths	1
Not very good	1	Trumpeters	1
Good	18	Musicians	2
Good when sober	1	Privates	56
Not good	2	Total	61
Fair	3		
Indifferent	6		
Poor	4		
Very poor	1		
Bad	2		
Very bad	1		
Worthless	3		
Unknown	3		
Total	61		

The number of desertions for the year ending June 30, 1896, and the percentage of loss from this cause, with comparison with the fiscal year just closed, are given below:

Year.	Average enlisted strength.	Number of desertions.	Percentage of loss.
1896	1,845	98	5.31
1897	1,799	61	3.39

Respectfully submitted.

FRANK L. DODDS,
Captain and Acting Judge-Advocate.

REPORT OF CAPT. JOHN S. MALLORY, ACTING JUDGE-ADVOCATE, DEPARTMENT OF THE COLORADO.

HEADQUARTERS DEPARTMENT OF THE COLORADO,
OFFICE OF THE JUDGE-ADVOCATE,
Denver, Colo., September 20, 1897.

The JUDGE-ADVOCATE-GENERAL, UNITED STATES ARMY,
Washington, D. C.

SIR: I have the honor to submit the annual report of the business of this office for the year ending August 31, 1897.

GENERAL COURTS-MARTIAL.

Commissioned officers tried	0
Enlisted men tried	132
Number of acquittals	4
Number of discharges on citation of previous convictions	19

Number of convictions of different offenses.

Seventeenth article of war:	
Losing clothing	1
Selling clothing	1
Twentieth article of war:	
Disrespect to commanding officer	2
Twenty-first article of war:	
Disobeying superior officer	9
Lifting up weapon against superior officer	1
Thirty-second article of war:	
Absence without leave	17
Thirty-third article of war:	
Failure to attend drill, roll call, etc	15
Thirty-eighth article of war:	
Drunkenness on duty	14
Thirty-ninth article of war:	
Quitting post	6
Forty-seventh article of war:	
Desertion	16
Sixty-second article of war:	
Absence without leave not chargeable under thirty-second article	6
Allowing prisoner to escape	1
Assault	1
Assault with deadly weapon	5
Breach of arrest	11
Carrying concealed weapons	2
Committing a nuisance	1
Committing sodomy	1
Disobedience of standing orders	1
Disobeying commissioned officer	3
Disobeying noncommissioned officer	13
Disorderly conduct	3
Disrespect to noncommissioned officer	4
Disrespect to superior officer	2
Drunkenness	13
Drunk and disorderly	10
Drunkenness causing arrest, etc., by civil authorities	3
Embezzlement	2
False statement	6
Fighting	1
Fraudulent enlistment	13
Insubordinate conduct toward noncommissioned officer	2
Insubordinate conduct toward commissioned officer	3
Larceny	3
Malingering	1
Neglect of duty	3
Resisting arrest	1
Threatening a superior officer	3
Conduct to the prejudice of good order and military discipline not included in the foregoing items	21

The following table shows the convictions of desertion, classified according to the limit of punishment prescribed by the President's order of March 20, 1895:

	Number.	Limit of confinement.
Surrendered:		*Months.*
After an absence of not over 30 days	3	12
After an absence of over 30 days	2	18
Apprehended:		
In service not over 6 months at time of desertion	4	18
In service over 6 months at time of desertion	7	30
Total number of convictions of desertion	16	.....
Average limit of confinement	.....	22½

Convictions of desertion:	
Year ending August 31, 1896	18
Year ending August 31, 1897	16
Decrease	2

INFERIOR COURTS.

The number of trials by inferior courts, the number of acquittals, and the number of different men tried are as follows:

Trials by garrison court	36
Trials by summary court	1,594
Total	1,630
Acquittals by garrison court	9
Acquittals by summary court	39
Total	48
Different men tried by garrison court	33
Different men tried by summary court	962
Total	995

DESERTIONS.

The number of desertions, the probable cause therefor, and the posts from which the desertions occurred are shown in the following tables:

Causes of desertion as found by boards of survey.

The probable cause.	The year of enlistment.				
	First.	Second.	Third.	Fourth.	Total.
Cause unknown	31	4	2	.....	37
General dissatisfaction	15	4	1	.....	20
To avoid trial	4	4	1	2	11
Debts	3	.....	.....	.....	3
Dislike of discipline	.....	.....	1	.....	1
Intoxicants	3	.....	.....	.....	3
General worthlessness	4	.....	2	1	7
Fast women	1	1	.....	.....	2
Roving disposition	2	1	.....	.....	3
To avoid practice march	.....	1	.....	.....	1
Secret marriage	1	.....	.....	.....	1
Domestic troubles	.....	.....	1	.....	1
Infatuation with another's wife	.....	1	.....	.....	1
Persuaded by others	1	1	.....	.....	2
Seduced a girl	.....	1	.....	.....	1
To begin mining	1	.....	.....	.....	1
Inherited money	1	.....	.....	.....	1
Theft and fear of punishment	2	2	.....	.....	4
Embezzlement	1	.....	.....	.....	1
Dislike of Arizona	1	.....	.....	.....	1
Total	71	20	8	3	102

The following table shows the average enlisted strength of each post in the department, the number of desertions therefrom, and the per cent. of desertions to the average strength:

Posts.	Strength.	Desertions.	Per cent.
Fort Apache	376	4	1.06
Fort Bayard	400	11	2.75
Fort Douglas	529	9	1.70
Fort Du Chesne	124	2	1.60
Fort Grant	417	12	2.87
Fort Huachuca	352	11	3.12
Fort Logan	649	36	5.54
Whipple Barracks	156	10	6.40
Fort Wingate	156	7	4.48

The per cent. of desertions in the department to the average enlisted strength is as follows:

For the year ending August 31, 1896	3.96
For the year ending August 31, 1897	3.22

REMARKS.

The Manual for Courts-Martial, approved by the Secretary of War and published for the information and guidance of all concerned, in defining the jurisdiction of general courts-martial, declares that "*As regards offenses*, they have *exclusive jurisdiction* * * * over those for which the limit of punishment prescribed by the President, previous convictions being considered, is in excess of the limit of the punishing power of an inferior court as defined by the eighty-third article of war." * * *

This construction has the effect of increasing the number of cases which must be tried by general courts, if tried at all, and renders illegal the trial by inferior courts of a class of cases formerly considered triable by them. Thus, if the *maximum* punishment, previous convictions considered, which can be awarded may be more than a month's confinement and forfeiture of a month's pay, the offense, if tried at all, *must* be tried by a general court-martial, even if it is not allowable to impose dishonorable discharge.

In view of the significant fact that what is *mandatory* in the President's order is that certain punishments *must not be exceeded*, not that certain punishments *must be awarded* upon conviction, it is difficult to understand why inferior courts should not be allowed concurrent jurisdiction with general courts over the class of offenses referred to above, especially in view of what is declared in Article V of the President's order.

A construction which would require charges for such offenses to be forwarded to the department commander, and which would allow him to exercise his discretion in either referring them for trial to a general court, or in remanding them for trial by a summary court, would, in my opinion, be in the interest of the administration of military justice.

The foregoing remarks were also made in my report to the department commander for the year ending June 30, 1897.

Desertions.—I am of opinion that the large number of desertions from the Army annually can be attributed, in general, to the following causes:

(1) Natural restlessness, which is an American characteristic, and disposition to change one's occupation for temporary and often trivial reasons, which, however, in the case of men who commit the crime of desertion, prove stronger than their respect for the sanctity of the oath of enlistment.

(2) The ease with which the crime can be accomplished and the slight probability of subsequent apprehension and consequent punishment.

Among civilians there is apt to be much mistaken sympathy for deserters in time of peace, and the small reward offered is not sufficient to encourage civil officers to make much effort to apprehend this class of criminals. The remedy would seem to be to cultivate the same sentiment without the service in regard to desertion as exists within the service and to largely increase the reward for apprehension.

It may not be practicable by legislation to do the former; it is certainly practicable to do the latter.

Very respectfully,

JOHN S. MALLORY,
Captain, United States Army, Acting Judge-Advocate.

REPORT OF OFFICER IN CHARGE OF JUDGE-ADVOCATE'S OFFICE, DEPARTMENT OF THE EAST.

HEADQUARTERS DEPARTMENT OF THE EAST,
JUDGE-ADVOCATE'S OFFICE,
Governors Island, New York, September 10, 1897.

The JUDGE-ADVOCATE-GENERAL, UNITED STATES ARMY,
Washington, D. C.

SIR: In obedience to the provisions of paragraph 891, Army Regulations, I have the honor to submit the following report of the business of this office for the period commencing September 1, 1896, and ending August 31, 1897:

Commissioned officers tried by general court-martial	1
Enlisted men tried by general court-martial (convicted, 439; acquitted, 23)	462
Total	463
Trials by general courts-martial, year ending August 31, 1896	490
Decrease	27

Cases apparently brought before general courts-martial with a view to discharge on proof of five or more previous convictions:

Year ending August 31, 1896	61
Year ending August 31, 1897	102
Increase	41

Trials for fraudulent enlistment alone:

Year ending August 31, 1896	23
Year ending August 31, 1897	14
Decrease	9

Decrease of trials this year as compared with last, leaving out trials with a view to discharge on proof of prior convictions, and trials for fraudulent enlistments, 59.

Number of convictions of different offenses, taken from the records of trials by general courts-martial, in the department during the year ending August 31, 1897.

Seventeenth article of war:	
Losing or selling clothing	12
Twentieth article of war:	
Disrespect to commanding officer	1
Twenty-first article of war:	
Disobeying superior officer	22
Thirty-second article of war:	
Absence without leave	113
Thirty-third article of war:	
Failure to attend drill, roll call, etc	48
Thirty-eighth article of war:	
Drunkenness on duty	46
Thirty-ninth article of war:	
Quitting post	9
Sleeping on post	9
Fortieth article of war:	
Quitting guard	7
Forty-seventh article of war:	
Desertion (18 found guilty of absence without leave; 2 acquitted)	99
Sixtieth article of war:	
Larceny	2
Sixty-second article of war:	
Absence without leave, not chargeable under thirty-second article	2
Allowing prisoner to escape	2
Assault	9
Assault with intent to kill	1
Breach of arrest	10
Disobeying commissioned officer	3
Disobeying noncommissioned officer	14
Disobeying sentinel	2
Disposing of clothing and camp equipage	1
Disrespect to commanding officer	1
Drunkenness	24
Drunk and disorderly	8

Sixty-second article of war—Continued.

Drunkenness, etc., causing arrest by civil authorities	5
False statement	4
Fighting	1
Fraudulent enlistment	23
Indecent exposure of person	1
Insubordinate conduct toward noncommissioned officer	8
Introducing liquor into post	1
Larceny	13
Making an immoral and foul proposition to another soldier	1
Neglect of duty	3
Resisting arrest	3
Disorders, etc., charged as "conduct to the prejudice of good order and military discipline," not included under previous headings	115

The following table shows the desertions, classified, according to the limit of punishment prescribed in the Executive order of the President, published in General Orders, No. 16, Headquarters of the Army, 1895:

	Number.	Limit of confinement.
		Months.
Surrendered:		
After an absence of not more than 30 days	23	12
After an absence of more than 30 days	39	18
Apprehended:		
In service not more than 6 months	32	18
In service more than 6 months	25	30
Total number of desertions	119	.....
Average limit of confinement	.....	19.86

Trials for desertion:

Year ending August 31, 1896	131
Year ending August 31, 1897	119
Decrease	12

Of the number brought to trial, 34 were of cases originating in other departments.

Number of desertions in the department from July 1, 1895, to June 30, 1896	412
Number of desertions in the department from July 1, 1896, to June 30, 1897	339
Decrease	73

The average enlisted strength, the number of trials by inferior courts-martial, the number resulting in acquittal, and the number of different men tried at the different posts in the department, are shown in the following table:

Posts.	Average enlisted strength.	Garrison.	Summary.	Total.	Acquitted.	Different men tried.
Fort Adams	289	6	221	227	4	118
Fort Barrancas	134	2	132	134	1	68
Columbus Barracks	538	12	365	377	12	169
Fort Columbus	225	4	119	123	5	80
Fort Ethan Allen	238	.....	173	173	5	90
Fort Hamilton	295	13	221	234	13	137
Jackson Barracks	137	.....	51	51	4	41
Key West Barracks	129	5	77	82	.....	39
Madison Barracks	527	.....	286	286	2	168
Fort McHenry	195	8	75	83	2	51
Fort McPherson	592	1	266	267	7	154
Fort Monroe	508	1	197	198	6	195
Fort Myer	305	4	180	184	4	151
Fort Niagara	205	9	151	160	3	93
Plattsburg Barracks	527	2	262	264	6	156
Fort Porter	124	2	56	58	3	38
Fort Preble	67	.....	22	22	1	17
Fort Schuyler	127	.....	71	71	2	43
Fort Slocum	191	5	257	262	13	136
St. Francis Barracks	157	.....	68	68	4	40
Fort Thomas	527	1	339	340	7	197
Fort Trumbull	67	.....	44	44	.....	26
Fort Wadsworth	189	4	133	137	1	143
Fort Warren	130	2	59	61	1	74
Washington Barracks	350	9	169	178	4	114
In camps, etc	.....	.....	90	90	.....	.....
Total	6,773	90	4,084	4,174	220	2,536

The number of trials by inferior courts for the period ending August 31, 1896, was 4,232, as against 4,174 for the year covered by this report, showing a decrease of 58 cases this year, as compared with the corresponding period last year.

Very respectfully,

L. H. STROTHER,
First Lieutenant, First Infantry, A. D. C., in Charge of Office.

REPORT OF OFFICER IN CHARGE JUDGE-ADVOCATE'S OFFICE, DEPARTMENT OF THE MISSOURI.

HEADQUARTERS DEPARTMENT OF THE MISSOURI,
OFFICE OF THE JUDGE-ADVOCATE,
Chicago, Ill., September 9, 1897.

The JUDGE-ADVOCATE-GENERAL, UNITED STATES ARMY,
Washington, D. C.

SIR: I have the honor to submit the annual report of the business of this office for the year ending August 31, 1897.

TRIALS BY GENERAL COURT-MARTIAL.

Commissioned officers tried	1
The case is published in G. O. No. 7, c. s., these headquarters.	
Enlisted men tried	248
Number of acquittals	24
Number of discharges on citation of previous convictions	25

Number of convictions of different offenses.

Seventeenth article of war:	
Losing clothing	3
Losing Government property	5
Selling clothing	2
Twentieth article of war:	
Disrespect to commanding officer	1
Twenty-first article of war:	
Disobeying superior officer	6
Thirty-first article of war:	
Lying out of quarters	1
Thirty-second article of war:	
Absence without leave	45
Thirty-third article of war:	
Failure to attend drill, roll call, etc	16
Thirty-eighth article of war:	
Drunkenness on duty	11
Thirty-ninth article of war:	
Leaving post	7
Sleeping on post	7
Fortieth article of war:	
Quitting guard	7
Forty-seventh article of war:	
Desertion	68
Sixtieth article of war:	
Larceny	2
Sixty-second article of war:	
Absence without leave not chargeable under the thirty-second article	2
Abusing public animal	2
Allowing prisoner to escape	3
Assault	2
Assault with dangerous or deadly weapon	2
Breach of arrest	6
Disobeying noncommissioned officer	17
Disrespect to noncommissioned officer	10
Drunkenness	6
Drunk and disorderly	10
Drunkenness, etc., causing arrest by civil authorities	2
Forgery	1

Sixty-second article of war—Continued.

Fraudulent enlistment	12
Larceny	10
Neglect of duty	11
Perjury	1
Disorders, etc., charged under the sixty-second article of war, not included under previous heads	23

The following table shows the convictions of desertion, classified according to the limit of punishment prescribed in the President's orders of March 20, 1895:

	Number.	Limit of confinement.
		Months.
Surrendered:		
After an absence of not more than 30 days	4	12
After an absence of more than 30 days	26	18
Apprehended:		
In service not more than 6 months at time of desertion	19	18
In service more than 6 months	18	30
In service more than 6 months and prior conviction considered	1	42
Total number of convictions of desertion	68	
Average limit of confinement		21.176

Convictions of desertion:	
Year ending August 31, 1896	68
Year ending August 31, 1897	68

TRIALS BY INFERIOR COURTS.

The trials by inferior courts, the number of acquittals, and the number of different men tried are as follows:

Garrison	44
Summary	2,235
Total	2,279
Acquittals by garrison court	14
Acquittals by summary court	92
Total	106
Number of different men tried	1,410

The following table gives the average enlisted strength and number of trials by general and inferior courts for the years named:

Year.	Average enlisted strength.	Trials by general courts.	Trials by inferior courts.	Per cent. of trials by inferior courts-martial.
1891	3,004	225	1,958	65.18
1892	3,393	322	2,653	78.19
1893	3,308	290	2,140	64.69
1894	3,602	336	1,978	54.91
1895	3,689	274	2,369	64.21
1896	4,020	277	2,375	59.07
1897	4,180	248	2,279	54.52

DESERTIONS.

The number of desertions, the probable cause therefor as found by boards of survey, and the posts from which the desertion occurred are shown in the following tables:

Number of desertions and the probable cause therefor.

Probable cause.	Year of enlistment.					
	First.	Second.	Third.	Fourth.	Fifth.	Total.
Cause unknown	69	10	1	4	.....	84
General dissatisfaction	16	6	.....	.....	.....	22
To avoid trial and punishment	9	7	3	2	1	22
Heavily in debt	4	5	2	.....	.....	11
Domestic troubles	8	.....	2	.....	.....	10
General unfitness for the service	4	.....	.....	.....	.....	4
Roving or restless disposition	3	.....	.....	.....	.....	3
Had considerable money	1	1	.....	.....	.....	2
Fear of recognition as former deserter	2	.....	.....	.....	.....	2
General worthlessness	2	.....	.....	.....	.....	2
Supposed to be insane	1	.....	1	.....	.....	2
Homesickness	2	.....	.....	.....	.....	2
Intoxicants	1	.....	.....	.....	.....	1
Fear of horses	1	.....	.....	.....	.....	1
Constitutional timidity	1	.....	.....	.....	.....	1
Enlisted to get transportation west	1	.....	.....	.....	.....	1
Fear of bodily harm from comrades	1	.....	.....	.....	.....	1
Enlisted for the winter	1	.....	.....	.....	.....	1
Lack of moral strength	1	.....	.....	.....	.....	1
Total	128	29	9	6	1	173

Average enlisted strength and the desertions from posts in the department.

Posts.	Strength.	Desertions.	Per cent.
Fort Brady, Mich	255	6	2.35
Jefferson Barracks, Mo	404	45	11.11
Fort Leavenworth, Kans	760	25	3.28
Fort Logan H. Roots, Ark	131	10	7.63
Fort Reno, Okla	394	14	3.55
Fort Riley, Kans	802	28	3.49
Fort Sheridan, Ill	722	26	3.60
Fort Sill, Okla	426	9	2.11
Fort Wayne, Mich	286	10	3.49

The percentage of desertions for 1897 is 4.13; the percentage of desertions for 1896 was 6.74; a decrease this year of 2.61 per cent.

Respectfully submitted.

JAMES T. DEAN,
First Lieut. Fourteenth Infantry, Aide-de-Camp, in Charge of Office.

REPORT OF THE QUARTERMASTER-GENERAL OF THE ARMY.

REPORT

OF

THE QUARTERMASTER-GENERAL.

QUARTERMASTER-GENERAL'S OFFICE,
Washington, October 1, 1897.

SIR: I have the honor to submit the annual report of the Quartermaster's Department for the fiscal year ended June 30, 1897.

FINANCIAL STATEMENT.

By acts of Congress approved March 16 and June 6 and 11, 1896, there was appropriated for the service of the Quartermaster's Department for the fiscal year ended June 30, 1897, the sum of		$8,162,938.00
During the fiscal year there was deposited to the credit of appropriations 1896–97, amounts received from sales to officers, etc., the sum of		423,663.12
Making a total of		8,586,601.12
Of this amount there was remitted to disbursing officers	$6,718,957.63	
There was paid out on account of settlements made at Treasury of claims and accounts	11,798.23	
There was charged against appropriations by Treasury transfer warrants	18,000.00	
		6,748,755.86
Leaving a balance available for payment of outstanding obligations incurred or fulfillment of contracts properly entered into within the fiscal year of		1,837,845.26
On the 1st of July, 1896, there was on hand from regular appropriations for the service of the Quartermaster's Department pertaining to the fiscal year ended June 30, 1896		1,401,341.51
And from appropriations pertaining to previous fiscal years, including those for specific purposes, the sum of		803,347.27
Making a total balance on hand from all appropriations July 1, 1896, of		2,204,688.78
For specific purposes there was appropriated during the fiscal year ended June 30, 1897		53,666.92
During the year there was deposited and transferred to credit of the appropriations other than those of 1896–97, shown above, the sum of		288,634.68
Making a total of		2,546,990.38
Of said amount there was remitted to disbursing officers the sum of	$761,438.44	
There was paid out on account of Treasury settlements and transferred the sum of	324,600.88	
There was carried to surplus fund the sum of	577,204.63	
		1,663,243.95
Leaving a balance of		883,746.43

DUTIES OF THE QUARTERMASTER'S DEPARTMENT.

Under existing laws the Quartermaster's Department, under the direction of the Secretary of War, provides the Army with military stores and supplies requisite for its use, such as clothing and equipage, tents, band instruments, tableware and mess furniture, equipments for post bakeries, fuel, forage, stationery, lumber, straw for bedding for men and animals, all materials for camp, and for shelter for troops and stores, furniture for barracks, such as bunks, benches, chairs, tables, lockers, heating and cooking stoves for use in public barracks and quarters, tools for mechanics and laborers in the Quartermaster's Department, furniture, text-books, papers, and equipment for post schools, reading matter for post libraries, wagons, ambulances, carts, saddles, harness, water supply, sewerage, plumbing, illuminating supplies, and heating for all military posts and buildings.

The Department is also charged with the duty of transporting, by land and water, troops, munitions of war, equipments, and all articles of military supplies from the place of purchase to the several armies, garrisons, posts, and recruiting places.

Under act of Congress amending section 1661, Revised Statutes, for arming and equipping the militia, this Department supplies quartermaster stores, clothing, and equipage to the militia of the several States and Territories, and transports the same to said States and Territories. It also furnishes transportation for ordnance and ordnance stores issued by the United States to the militia of the several States and Territories. It also transports the property for other Executive Departments on requisitions, payments therefor being made by the respective Departments to the carriers upon accounts forwarded through the Quartermaster-General's Office for that purpose.

This Department prepares the necessary plans and constructs all buildings at military posts, such as barracks, quarters, storehouses, hospitals, etc., builds wharves, constructs and repairs roads for military purposes, builds all necessary military bridges, provides, by hire or purchase, grounds for military encampments and buildings; contracts for all horses for cavalry, artillery, and for the Indian scouts, and for such infantry and members of the Hospital Corps in the field campaigns as may be required to be mounted; pays for all incidental expenses of the military service which are not provided by other corps.

The care and maintenance of national cemeteries is an additional duty of this Department. It also provides suitable headstones to mark the graves of all soldiers, sailors, or marines who served during the late war, including those who have been buried in private cemeteries and other burial places.

Section 1139, Revised Statutes, makes it the duty of the Quartermaster-General, under the direction of the Secretary of War, to prescribe and enforce a system of accountability for all quartermaster supplies furnished the Army, its officers, seamen, and marines.

CLOTHING AND EQUIPAGE SUPPLIES.

Congress provided for this branch of the service for the last fiscal year the sum of $1,050,000. To this was added the sum of $162,855.05 for reimbursements on account of issues to the militia, and the sum of $86,262.99 for collections by the pay department and from sales to officers, etc., making a total of $1,299,118.04 available for clothing and equipage supplies for the fiscal year.

Of this amount the sum of $1,024,307.25 was paid out during the year, leaving a balance on hand of $274,810.79, of which $241,700.94 will be required to pay outstanding obligations. The remaining sum of $33,109.85, together with the sum of $15,000, estimated to be collected by the pay department after July 1, 1897, and credited to clothing appropriation for last fiscal year, will represent a total of $48,109.85 to be covered into the Treasury.

The issues to the militia of the several States and Territories during the last fiscal year amounted to the sum of $164,294.29, which includes the sum of $1,412.15 from appropriation "Regular supplies," and $37.09 from appropriation "Army transportation."

To the militia of the District of Columbia there were issued during the year clothing and equipage, transportation supplies and regular supplies to the value of $744.79, which sum will not be reimbursed to the appropriations from which taken.

Under act of Congress approved March 16, 1896, the sum of $4,221.25 was expended during the year for the purchase of citizens outer clothing, at a cost not to exceed $10 a suit, to be issued upon release from confinement to each prisoner who has been confined under a court-martial sentence involving dishonorable discharge.

The sum of $18,492.03 was realized at general depots from the sale of old pattern and unserviceable articles of clothing and equipage, which sum was covered into the Treasury and credited to miscellaneous receipts as required by law.

There was expended during the last fiscal year from the appropriations of the Quartermaster's Department the sum of $11,654.06 for the maintenance of the Apache Indian prisoners of war, confined by the military authorities at Fort Sill, Okla., which is $114.26 less than the expenditure for the same object during the previous fiscal year.

CAP DEVICES FOR ENLISTED MEN.

A full supply of the new cap devices has been purchased and issued to the entire Army. They seem to give general satisfaction. Steps have been taken to extend the issue of the same to the militia of the States.

SHOES.

The most important part of the equipment of a soldier is his foot gear. It has been the constant aim of this Department to procure and furnish the Army the most comfortable and best marching shoe obtainable. The present shoe was adopted in 1893, and was considered a great improvement upon any heretofore supplied to the troops. The uppers are made of calfskin weighing from 55 to 60 pounds to the dozen skins, and the materials used in their construction are the best and most durable that can be procured. Notwithstanding this, the shoes are not entirely satisfactory, and the Department is studying this subject with great care with a view to providing a shoe that will more perfectly meet all the requirements of the service.

IMPROVEMENT IN TENTS.

Complaints having been received in regard to the waterproof qualities, etc., of shelter tents, the Department has taken steps to improve the same by the use of duck made of yarn having a firmer twist and being more closely woven.

There were manufactured at the Philadelphia depot during the last fiscal year 250 of the improved conical tents, conforming to the design submitted by Maj. Charles W. Williams, quartermaster, United States Army, and which was patented by him so that the Government could have the benefit of the invention without cost for royalty.

A number of these tents have already been issued, and it is the intention of the Department to issue the remainder to extreme northern posts when required, and where their use and trial in winter will demonstrate whether the tent should entirely supersede the regular conical wall tent.

TENTS FOR FLOOD AND CYCLONE SUFFERERS.

The demand for the loan of tents for use of the people who were rendered homeless by the inundations of the Mississippi River during the spring of the present year became so urgent that Congress, by joint resolution, approved March 24, 1897, appropriated funds for the purchase of 1,000 tents to shelter and relieve these sufferers. Under this authority the number of tents authorized were purchased at a cost of $7,837.97. There were at the St. Louis depot 348 additional tents which were left on hand from those purchased under a previous authority of Congress, which made a total of 1,348 tents available. Nearly all of these tents were distributed to Memphis, Helena, and Vicksburg.

Tents were also loaned during the fiscal year, by authority of the Secretary of War, to the citizens of El Paso, Tex., who were rendered homeless by the inundations of Rio Grande River, and also to the cyclone sufferers at Chandler, Okla.

COLORS AND FLAGS FOR THE SECRETARY OF WAR.

A silken flag and bunting color having been established for the use of the Secretary of War, standard samples and specifications have been adopted. Both color and flag are of scarlet, and the design consists of an eagle with outspread wings, and a star in each of the four corners.

TRANSPORTATION.

Transportation was furnished by the Quartermaster's Department during the last fiscal year for 371,611 persons, 4,295 animals, and 98,590 tons of materials.

The cost of the principal movement of troops, exclusive of deductions on account of land-grant and bond-aided railroads, amounted during the year to $182,640.99. Of which amount the sum of $25,248.04 was expended since March 4, 1897.

The sum of $22,898.06 was expended for the transportation of troops in connection with summer encampments, practice marches, etc., and the sum of $5,577.59 for the transportation of enlisted men engaged in rifle competition and target practice.

There were transported for the Army over the bond-aided Pacific railroads during the fiscal year, 6,726 persons, 889 animals, and 34,307,732 pounds of freight.

This Department owns ten steamboats which have been kept in service during the year at a cost, including repairs, of $79,894.03. In addition, the sum of $2,741.37 was expended for the hire of vessels temporarily required.

CAVALRY AND ARTILLERY HORSES.

During the fiscal year 888 cavalry and 81 artillery horses were provided at an average cost of $133.10 each for cavalry horses and $146 each for artillery horses.

There were also purchased 42 team horses and 344 mules at a cost of $37,685.53. The average cost of the former was $158.54 each and of the latter $90.19 each.

There were sold and died during the year 1,061 cavalry and artillery horses, 30 team horses, and 305 mules, leaving on hand at the close of the year 6,006 cavalry and artillery horses, 525 team horses, and 3,148 mules.

ROADS, WALKS, ETC.

The sum of $88,415.03 was expended during the fiscal year for roads, walks, grading, and bridges; $3,539.19 for wharves, and $224,881.39 for water supply, sewerage, plumbing, and drainage.

REGULAR SUPPLIES.

The sum of $103,699.30 was expended for lighting, heating, and cooking apparatus, and $8,422.59 for tableware and kitchen utensils.

BARRACKS AND QUARTERS.

Congress, by act approved March 16, 1896, provided the sum of $750,000 under the head of "Barracks and quarters," and under the act approved June 6, 1896, making appropriation for fortifications, appropriated a sum not exceeding $100,000 for the construction of necessary buildings connected therewith, making a total of $850,000 available for construction.

This sum was expended during the last fiscal year in the construction of barracks, officers' quarters, storehouses, stables, etc., and for the repair and alteration of buildings, and for rent.

The sum of $74,852.82 was also expended during the year in the construction and repair of hospitals at military posts, which includes a new hospital under construction at Fort Monroe, Va., at a cost of $17,954.38, and one at Fort Wadsworth, N. Y., at a cost of $16,240.

MILITARY POSTS.

By act of Congress approved June 11, 1896, the sum of $300,000 was appropriated "for the construction of buildings at, and the enlargement of, such military posts as in the judgment of the Secretary of War may be necessary."

This sum was apportioned as follows:

Presidio of San Francisco, Cal	$77,959.25
Jefferson Barracks, Mo	19,472.61
Plattsburg Barracks, N. Y	42,977.11
Fort Harrison, Mont	4,739.00
Fort Hancock, N. J	80,000.00
Fort Ethan Allen, Vt	18,948.80
Fort Myer, Va	19,594.98
Fort Wayne, Mich	13,471.29
Fort Hamilton, N. Y	6,884.00
Fort Bliss, Tex	8,143.00
Fort Porter, N. Y	7,500.00
Balance June 30, 1897	309.96
Total	300,000.00

Some of the buildings authorized at the above-mentioned posts have already been completed, some are in course of erection, and others are under contract.

FORT HARRISON, MONT.

This post is being enlarged by the construction of one double barrack and one double set of officers' quarters, which cost, including plumbing, heating, gas-piping, etc., $54,817, $40,000 of which is provided under act approved June 11, 1896, and the remainder from other funds of Quartermaster's Department.

FORT WAYNE, MICH.

In addition to the construction of one double set of officers' quarters and double set of noncommissioned staff officers' quarters at Fort Wayne, Mich., there has been expended on this reservation the sum of $20,000 by grading and filling in the river front, which sum was appropriated by act of Congress approved June 11, 1896.

PRESIDIO OF SAN FRANCISCO, CAL.

At this post two double barrack buildings were erected during the year at a cost, including plumbing, gas piping, and lockers for same, of $83,999.25.

In addition to the above, various other improvements were made on this reservation during the year from the special appropriations provided for the purpose. These improvements consisted mainly of planting of trees, repair of fences and gates, construction of stone wing and inclosing walls, and construction of roadways, etc.

Out of the appropriation of $10,000 provided for the improvement of this reservation by act approved June 11, 1896, there remained on hand at the close of the fiscal year the sum of $7,081.44, which will be required to pay for the construction of the inclosing wall, under contract with A. E. Buckman.

FORT HANCOCK, N. J.

The construction of a military post at Sandy Hook having been authorized by the Secretary of War, thirty-two buildings have been contracted for and are in course of erection at this post, which improvements include the water-supply and sewer systems, together with the necessary plumbing, gas-piping, and heating apparatus, for such of these buildings as require it. Cost of the work is $324,752.50.

MILITARY POST AT SPOKANE, WASH.

Congress, under act approved June 11, 1896, appropriated the sum of $100,000 for beginning the construction of permanent buildings, providing sewerage, water supply, and other necessary improvements at Spokane, Wash.

This money is being expended in the construction of four double sets officers' quarters and one double barrack in brick, including plumbing, heating, and gas-piping for same; also two double sets noncommissioned staff officers' quarters (brick), including plumbing and gas-piping, costing $97,500.

FORT RILEY, KANS.

Under the same act, Congress provided the sum of $75,000 to continue the construction of buildings at Fort Riley, Kans., out of

which the following buildings have been contracted for and are being erected:

One artillery barrack and outhouse (stone)	$20,480.00
Two double sets artillery officers' quarters (stone)	18,172.00
One quartermaster's stable (stone)	8,109.00
Five cavalry-stable guard buildings (stone)	4,975.00
One wagon and two ambulance sheds and stone wall	2,875.00
Quartermaster's shops and quarters (stone)	7,100.00
One office and stable guard building (stone)	881.00
Stone wall around quartermaster's corral	501.60
One chapel and school building (stone)	11,500.00
Total	74,593.60

FORT D. A. RUSSELL, WYO.

Congress also provided by the same act the sum of $40,000 to extend the barracks at this post, which has been expended in making brick additions to existing barracks.

FORT PORTER, NEAR BUFFALO, N. Y.

The sum of $24,170.20 was allotted during the year for the construction of three double sets of officers' quarters and one double set of noncommissioned staff officers' quarters, including plumbing, heating, and gas-piping for same.

A portion of this work is already completed and the remainder in course of construction.

FORT MONROE, VA.

Under the same act, Congress appropriated the sum of $15,000 to erect upon the Government reservation at this post a post-office building, to cover quarters for the postmaster and office accommodations for customs officer and United States commissioner.

This building is now being erected under contract, at the following cost:

For construction	$11,940.00
For plumbing, heating, etc	1,985.01
Total	13,925.01

MILITARY POST AT BISMARCK, N. DAK.

By act of Congress approved June 11, 1896, the sum of $40,000 was provided for beginning the construction of permanent buildings for a military post at Bismarck, N. Dak., which the Secretary of War was authorized to establish by act of Congress approved March 2, 1895, provided that a sufficient quantity of land, not less than 640 acres, suitable for the purpose, should be donated free of cost to the United States.

As none of the sites offered by the citizens of Bismarck and vicinity were suitable for the establishment of a military post thereon, no steps have been taken for the erection of buildings at that place, and no portion of the funds provided for that special object has been expended. The appropriation for this purpose was an annual one, and is therefore no longer available.

RESERVATIONS.

Forty-two lots, comprising part of old Fort Brady, Mich., have been sold, under the act approved July 8, 1886, and the sum of $36,400 realized therefrom. Twenty-two lots still remain unsold.

The sum of $4,950 has been realized from the sale of lots comprising

old Fort Bliss, Tex., under act approved March 1, 1890. Out of the receipts from the sale of this reservation a military road between the city of El Paso and new Fort Bliss, Tex., is to be constructed, at a cost not exceeding $4,000, as provided for by act approved August 9, 1894.

The citizens of Seattle, Wash., representing the chamber of commerce, first tendered about 703 acres of land about 3 miles from Seattle, for the construction of a military post at that place, but it having subsequently been shown to the satisfaction of the War Department that insurmountable obstacles prevented the citizens from acquiring the full tract, as originally tendered, a slightly reduced area has been made acceptable to the Department, the title papers of which are being collected for action of the Department of Justice.

The act of Congress approved June 11, 1896, provided $18,000 for the purchase of land for a target range for the use of troops stationed at Jefferson Barracks, Mo., provided that any land purchased "shall be unencumbered by any private or public ways or roads."

This office possesses no information as to what steps, if any, the War Department has taken with a view to securing the range. The $18,000 provided for this purpose has been again appropriated by act approved June 4, 1897, and made available for expenditure during the fiscal year ending June 30, 1898.

Owing to business depression, etc., no steps have yet been taken looking to the disposition by sale of the valuable land, some 80 acres, which comprise old Fort Omaha, the sale of which is provided for by act approved July 23, 1888.

Portions of the reservations of Fort Robinson, Nebr., Sucia Islands, Gulf of Georgia, Washington, and Fort Clinch, Fla., have been transferred to the Interior Department.

NATIONAL CEMETERIES.

There are 83 national cemeteries and 75 superintendents. Nine thousand nine hundred and fourteen white marble headstones were provided during the year to mark the graves of known Union soldiers, sailors, and marines in national, post, city, and village cemeteries.

The roadway authorized by act of Congress approved June 8, 1896, from the north side of Cache River bridge, in Pulaski County, Ill., to connect with the graveled road running from Mound City, Ill., to the Illinois Central Railroad, is nearly completed. The sum of $15,000 was appropriated for this work, and the sum of $10,656.75 was expended during the year.

The draining and repairing of the road to the Hampton (Va.) National Cemetery, authorized by acts approved March 2, 1889, and August 30, 1890, still await the action of the board of supervisors of Elizabeth City County, Va., relating to obtaining the right of way required by law.

The sum of $8,805.78 was expended during the fiscal year in making necessary repairs to roadways to national cemeteries.

During the year the necessary improvements and repairs have been made at the various national cemeteries, which consisted mainly of the construction of rostrums and outbuildings, erection of flagstaffs, repairs to lodges, inclosing walls, gates, fences, driveways, walks, water supply, drainage, etc.

At the San Francisco (Cal.) National Cemetery a white bronze monument, surmounted by a statue of a soldier, was erected by the Regular Army and Navy Union in the center of plot No. 7, on the east side of the cemetery.

HALL OF RECORDS.

Attention is again called to the necessity of a suitable fireproof building to contain the records of all the Executive Departments. The congested conditions of the space for the storage of valuable papers in the War Department calls for early action. This subject was considered at the second session of the Fifty-fourth Congress, but no legislation resulted. It is earnestly hoped that Congress will give further consideration to this important matter at its coming session.

The location of this building is of great importance, and should be within convenient access to all the Executive Departments.

Respectfully,

GEO. H. WEEKS,
Quartermaster-General, United States Army.

Hon. R. A. ALGER,
Secretary of War.

List of papers accompanying the annual report of the Quartermaster-General for the fiscal year ended June 30, 1897.

1. Report of Lieut. Col. James Gilliss, deputy quartermaster-general, U. S. A., of the operations of the correspondence and examining division (which includes finance, inspection, money accounts, returns of quartermaster supplies, and clothing supply) for the fiscal year ended June 30, 1897.

A. Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department, June 30, 1896, the quantities purchased, manufactured, received from posts and depots, taken up, sold, transferred to general depots, expended, issued to the Army and the militia, and the quantities remaining in the depots, June 30, 1897.

2. Report of Maj. Charles Bird, quartermaster, U. S. A., of the operations of the supply and transportation division (which includes regular supplies and transportation) for the fiscal year ended June 30, 1897.

3. Report of Capt. Crosby P. Miller, assistant quartermaster, U. S. A., of the operations of the construction and repair division (which includes barracks and quarters and reservations) for the fiscal year ended June 30, 1897.

4. Report of Capt. John T. French, jr., assistant quartermaster, U. S. A., of the operations of the mail and record division (which includes mail and record, records, files and claims, and national cemeteries) for the fiscal year ended June 30, 1897.

A. Statement showing national cemeteries, giving class, location, size, number of interments, etc., on June 30, 1897.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., August 13, 1897.

GENERAL: I have the honor to submit a report of the operations of the correspondence and examining division of this office for the fiscal year ended June 30, 1897, which will be considered in the following order of business:

Finance, inspection, money accounts, returns of quartermaster supplies, and clothing and equipage supplies.

FINANCE.

Under this head all matters are considered relating to the procurement and distribution of funds, the compilation and preparation for Congress of the annual estimates of funds for the service of the Quartermaster's Department, and for funds required for the Quartermaster-General's office, the examination of estimates of funds received from disbursing officers, and the issue of requisitions in favor of such disbursing officers, the action upon settlements made at the Treasury of claims and accounts pertaining to the Quartermaster's Department.

Financial statement for fiscal year ending June 30, 1897.

[From the balance books in which all debits and credits are recorded.]

Appropriations.	Balance in Treasury undrawn July 1, 1896.	Appropriated.		Placed to credit of appropriations during the year, being the proceeds of sales to officers, etc.	Placed to credit of appropriations by Treasury transfer warrants.	Total to be accounted for.	Remitted to disbursing officers.	Requisitions issued on settlements made at Treasury of claims and accounts.	Amounts charged against appropriations by Treasury transfer warrants.	Amounts carried to surplus fund, act June 20, 1874.	Balance in Treasury undrawn June 30, 1897, and available for outstanding obligations.	Total accounted for.
		Amount.	Date of act.									
1894 and prior years.												
Regular supplies				$242.50		$242.50				$242.50		$242.50
Incidental expenses				295.58		295.58				295.58		295.58
Barracks and quarters				.87		.87				.87		.87
Transportation of the Army and its supplies				269.70		269.70				269.70		269.70
Clothing, camp and garrison equipage				625.36		625.36				625.36		625.36
Total				1,434.01		1,434.01				1,434.01		1,434.01
1894 and prior years, transfer account.												
Regular supplies				71.47		71.47			$71.47			71.47
Transportation of the Army and its supplies				13.00		13.00			13.00			13.00
Clothing, camp and garrison equipage				70.87		70.87			70.87			70.87
Total				155.34		155.34			155.34			155.34
1895.												
Regular supplies	$375,496.00			2,535.24		378,031.24		$486.18		377,545.06		378,031.24
Incidental expenses	29,682.71			726.99		30,409.70		1,546.11		28,863.59		30,409.70
Horses for cavalry and artillery	29,812.44			6.50		29,818.94				29,818.94		29,818.94
Barracks and quarters	11,029.68			60.91		11,090.59	$1,080.26			10,010.33		11,090.59
Transportation of the Army and its supplies	99,781.87			7,296.59		107,078.46	2,046.98	5,061.17		99,970.31		107,078.46
Clothing, camp and garrison equipage	17,328.55			3,832.39		21,160.94		55.46		21,105.48		21,160.94

Construction and repair of hospitals	69.00					69.00				69.00		69.00
National cemeteries	673.51			105.27		778.78		67.98		710.80		778.78
Pay of superintendents of national cemeteries	783.01			50.00		833.01				833.01		833.01
Shooting galleries and ranges	1,384.92			43.22		1,428.14				1,428.14		1,428.14
Quarters for hospital stewards	116.98					116.98				116.98		116.98
Military posts	54.93					54.93				54.93		54.93
Repairing roads to national cemeteries	1,500.29					1,500.29				1,500.29		1,500.29
Burial of indigent soldiers	2,000.00					2,000.00	198.33			1,801.67		2,000.00
Headstones for graves of soldiers	1,729.82			9.23		1,739.05		1.78		1,737.27		1,739.05
Land for rifle range near Madison Barracks, N. Y.	13.00					13.00					$13.00	13.00
Total	571,456.71			14,666.34		586,123.05	3,325.57	7,218.68		575,565.80	13.00	586,123.05
Barracks and quarters, 1895 and 1896	34,075.59			5,068.37		39,143.96	27,618.95	115.00			11,410.01	39,143.96
1896.												
Regular supplies	463,004.28			68,011.00		531,015.28	80,450.90	3,360.15			447,204.23	531,015.28
Incidental expenses	49,063.66			6,988.24		56,051.90	9,173.95	650.84			46,227.11	56,051.90
Horses for cavalry and artillery	24,253.75			340.55		24,594.30	24,035.70				558.60	24,594.30
Transportation of the Army and its supplies	532,090.02			40,638.98		572,729.00	228,114.01	40,803.35			303,811.64	572,729.00
Clothing, camp and garrison equipage	286,336.75			25,573.75		311,910.50	289,308.22				22,602.28	311,910.50
Construction and repair of hospitals	359.00			471.35		830.35	465.34				365.01	830.35
National cemeteries	3,976.10			1,245.15		5,221.25	3,496.25	349.83			1,375.17	5,221.25
Pay of superintendents of national cemeteries	152.99					152.99					152.99	152.99
Shooting galleries and ranges	.93			767.47		768.40					768.40	768.40
Quarters for hospital stewards	15.04			111.94		126.98	118.80				8.18	126.98
Military posts	28,796.72					28,796.72	27,816.50				980.22	28,796.72
Repairing roads to national cemeteries	106.92			118.25		225.17					225.17	225.17
Burial of indigent soldiers	1,500.00					1,500.00	133.50				1,366.50	1,500.00
Headstones for graves of soldiers	11,685.35			.15		11,685.50	11,475.55	119.33			90.62	11,685.50
Total	1,401,341.51			144,266.83		1,545,608.34	674,588.72	45,283.50			825,736.12	1,545,608.34

Financial statement for fiscal year ending June 30, 1897—Continued.

Appropriations.	Balance in Treasury undrawn July 1, 1896.	Appropriated.		Placed to credit of appropriations during the year, being the proceeds of sales to officers, etc.	Placed to credit of appropriations by Treasury transfer warrants.	Total to be accounted for.	Remitted to disbursing officers.	Requisitions issued on settlements made at Treasury of claims and accounts.	Amounts charged against appropriations by Treasury transfer warrants.	Amounts carried to surplus fund, act June 20, 1874.	Balance in Treasury undrawn June 30, 1897, and available for outstanding obligations.	Total accounted for.
		Amount.	Date of act.									
1897.												
Regular supplies		$2,200,000.00	Mar. 16, 1896	$137,581.36		$2,337,581.36	$1,849,944.39	$2,367.49			$485,269.48	$2,337,581.36
Incidental expenses		600,000.00	....do....	2,830.18		602,830.18	549,369.77	224.41			53,236.00	602,830.18
Horses for cavalry and artillery		130,000.00	....do....	278.82		130,278.82	130,278.82					130,278.82
Barracks and quarters		750,000.00	....do....	659.19		850,659.19	655,769.95				194,889.24	850,659.19
Do		100,000.00	June 6, 1896									
Transportation of the Army and its supplies		2,400,000.00	Mar. 16, 1896	15,502.80		2,415,502.80	1,891,400.27	9,178.33			514,924.20	2,415,502.80
Clothing, camp and garrison equipage		1,050,000.00	....do....	249,118.04		1,299,118.04	1,024,297.25	10.00			274,810.79	1,299,118.04
Construction and repair of hospitals		75,000.00	....do....	163.32		75,163.32	75,110.90				52.42	75,163.32
National cemeteries		100,000.00	June 11, 1896			100,000.00	88,262.34	4.45			11,733.21	100,000.00
Pay of superintendents of national cemetaries		61,880.00	....do....			61,880.00	61,879.67				.33	61,880.00
Shooting galleries and ranges		10,000.00	Mar. 16, 1896			10,000.00	9,974.30				25.70	10,000.00
Quarters for hospital stewards		7,000.00	....do....	529.41		7,529.41	7,529.41					7,529.41
Military posts		300,000.00	June 11, 1896	17,000.00		317,000.00	188,164.55				128,835.45	317,000.00
Repairing roads to national cemeteries		8,000.00	....do....			8,000.00	7,944.28				55.72	8,000.00
Burial of indigent soldiers		3,000.00	....do....			3,000.00	2,000.00				1,000.00	3,000.00
Headstones for graves of soldiers		20,000.00	....do....			20,000.00	18,607.45	13.55			1,379.00	20,000.00
Road to the national cemetery, Presidio of San Francisco, Cal		10,000.00	....do....			10,000.00	10,000.00					10,000.00
Military cemetery at Key West, Fla		2,058.00	....do....			2,058.00	2,058.00					2,058.00
Military post, Spokane, Wash		100,000.00	....do....			100,000.00	15,373.33				84,626.67	100,000.00
Military post, Fort Riley, Kans		75,000.00	....do....			75,000.00	28,131.00				46,869.00	75,000.00

Military post, Fort Harrison, Mont.		40,000.00	do			40,000.00	40,000.00					40,000.00
Military post, Fort D. A. Russell, Wyo.		40,000.00	do			40,000.00	40,000.00					40,000.00
Military post, Bismarck, N. Dak.		40,000.00	do			40,000.00					40,000.00	40,000.00
Fort Wayne Military Reservation		20,000.00	do			20,000.00	19,861.95				138.05	20,000.00
Additional lands Fort Ethan Allen Military Reservation		3,000.00	do			3,000.00	3,000.00					3,000.00
Target range, Jefferson Barracks, Mo.		18,000.00	do			18,000.00			$18,000.00			18,000.00
Total		8,162,938.00		423,663.12		8,586,601.12	6,718,957.63	11,798.23	18,000.00		1,837,845.26	8,586,601.12
Certified claims.												
Regular supplies	$100.24					100.24		100.24				100.24
Horses for cavalry and artillery				145.00		145.00		145.00				145.00
Barracks and quarters	28,409.79					28,409.79		28,409.79				28,409.79
Transportation of the Army and its supplies	88,995.96					88,995.96		87,042.54			1,953.42	88,995.96
Horses and other property lost in the military service	33,645.28			5,867.31		39,512.59	6,439.28	27,206.00		$200.00	5,667.31	39,512.59
Total	151,151.27			6,012.31		157,163.58	6,439.28	142,903.57		200.00	7,620.73	157,163.58
Indefinite or special.												
Additional lands Fort Ethan Allen Military Reservation	7,000.00					7,000.00	7,000.00					7,000.00
Burial of indigent soldiers	700.00					700.00	700.00					700.00
Bellevue rifle range, Omaha, Nebr	600.00					600.00		600.00				600.00
Deportation of refugee Canadian Cree Indians		5,000.00	May 13, 1896			5,000.00	4,961.28	38.72				5,000.00
Headstones for graves of soldiers				4.82		4.82				4.82		4.82
Hospital, Fort Meade, S. Dak.	367.09			163.23		530.32	106.67				423.65	530.32
Military storehouse, Omaha, Nebr.	11,019.13					11,019.13					11,019.13	11,019.13
Military road from El Paso, Tex., to new Fort Bliss, Tex.		4,000.00	Aug. 9, 1894			4,000.00	4,000.00					4,000.00
Purchase of buildings at military posts	9,977.48					9,977.48					9,977.48	9,977.48
Purchase of land for target ranges, Fort McPherson, Ga.				3.20		3.20					3.20	3.20

Financial statement for fiscal year ending June 30, 1897—Continued.

Appropriations.	Balance in Treasury undrawn July 1, 1896.	Appropriated.		Placed to credit of appropriations during the year, being the proceeds of sales to officers, etc.	Placed to credit of appropriations by Treasury transfer warrants.	Total to be accounted for.	Remitted to disbursing officers.	Requisitions issued on settlements made at Treasury of claims and accounts.	Amounts charged against appropriations by Treasury transfer warrants.	Amounts carried to surplus fund, act June 20, 1874.	Balance in Treasury undrawn June 30, 1897, and available for outstanding obligations.	Total accounted for.
		Amount.	Date of act.									
Indefinite or special—Cont'd.												
Payment to John Finn		$6,363.95	June 8, 1896			$6,363.95		$5,820.84			$543.11	$6,363.95
Payment to legal representative of Geo. Case		475.00	Mar. 27, 1896			475.00		475.00				475.00
Post-office, Fortress Monroe, Va		15,000.00	June 11, 1896			15,000.00					15,000.00	15,000.00
Road to the national cemetery at Hampton, Va	$2,000.00					2,000.00					2,000.00	2,000.00
Road to the national cemetery, Illinois	15,000.00					15,000.00	$15,000.00					15,000.00
Relief of August P. Burditt, surviving partner of Burditt & Fisk		5,130.00	Mar. 27, 1896			5,130.00		5,130.00				5,130.00
Sewerage system, Fortress Monroe, Va		9,860.00	June 8, 1896			9,860.00	9,860.00					9,860.00
Tents for sufferers from floods in the Mississippi River		7,837.97	Mar. 24, 1897			7,837.97	7,837.97					7,837.97
Total indefinite	46,663.70	53,666.92		$171.25		100,501.87	49,465.92	12,064.56		$4.82	38,966.57	100,501.87
Pacific roads.												
1894 and prior years					$214.04	214.04		214.04				214.04
1895				36.74	6,775.53	6,812.27		6,812.27				6,812.27
1896				115.49	88,542.23	88,657.72		88,657.72				88,657.72
1897					21,176.20	21,176.20		21,176.20				21,176.20
Total				152.23	116,708.00	116,860.23		116,860.23				116,860.23
Grand total	2,204,688.78	8,216,604.92		595,589.80	116,708.00	11,133,591.50	7,480,396.07	336,243.77	$18,155.34	577,204.63	2,721,591.69	11,133,591.50

The records of this office show the following amounts remitted from regular and from indefinite or special appropriations:

Remitted from regular appropriations, fiscal year 1897.

Department, etc.	Regular supplies.	Incidental expenses.	Horses for cavalry and artillery.	Barracks and quarters.	Transportation of the Army and its supplies.	Clothing and equipage.
Department of the East	$287,442.12	$71,171.40	.....	$153,385.35	$215,623.41	$2,339.05
Department of the Missouri	269,596.62	61,667.14	.....	72,107.60	238,163.75	1,793.05
Department of Texas	115,335.25	29,750.92	.....	35,480.19	76,034.25	280.00
Department of the Platte	197,037.51	39,440.19	.....	38,901.50	113,077.24	732.00
Department of Dakota	224,538.57	43,922.31	.....	38,521.78	130,446.91	1,816.75
Department of California	87,699.39	27,770.40	$8,167.87	24,730.15	81,977.88	530.00
Department of Colorado	265,343.98	43,106.80	.....	51,940.40	224,307.04	16,367.90
Department of Columbia	98,963.79	24,550.43	2,741.45	13,923.81	71,591.80	225.00
Depot at New York	70,136.14	28,518.19	.....	6,067.47	218,672.07	68.73
Depot at Philadelphia	20,658.93	25,543.42	.....	7,749.64	64,597.53	910,748.09
Depot at San Francisco	13,395.44	17,399.98	.....	14,271.92	32,900.23	24,114.20
Depot at St. Louis	12,830.56	15,407.98	17,050.00	3,627.24	109,246.81	10,556.44
Depot at Washington	26,841.98	28,863.05	.....	5,734.47	106,485.06	55.00
Depot at Jeffersonville	58,879.97	23,650.50	.....	1,225.90	83,568.65	54,659.29
Columbus Barracks, Ohio	.....	133.33	.....	.....	.....	.....
Jefferson Barracks, Mo	6,310.16	2,753.51	.....	24,253.60	14,580.15	.....
Plattsburg Barracks, N. Y	21,035.35	5,980.59	.....	49,787.80	14,403.17	.....
Hot Springs, Ark	2,929.00	2,227.67	.....	272.00	1,259.50	.....
Little Rock, Ark	567.99	2,258.32	.....	2,079.67	1,411.06	.....
Springfield Armory, Mass	1,859.12	330.00	.....	.....	.....	.....
West Point, N. Y	24,892.11	11,035.08	.....	.....	6,227.64	.....
Willets Point, N. Y	1,000.10	1,960.54	.....	12,580.59	2,774.98	10.00
Atlanta, Ga	1,720.00	3,748.50	.....	300.00	563.00	.....
Bismarck, N. Dak	436.49	1,708.22	.....	180.00	103.05	.....
Chicago, Ill	457.10	2,917.94	102,319.50	415.00	10,004.60	.....
Seattle, Wash	106.33	1,867.56	.....	260.50	1,475.60	.....
Spokane, Wash	362.98	2,747.86	.....	280.00	2,170.37	1.75
Fort D. A. Russell, Wyo	207.00	1,994.00	.....	10,533.00	7,850.00	.....
Fort Delaware, Del	661.06	645.50	.....	15,749.19	3,873.80	.....
Fort Ethan Allen, Vt	2,686.04	3,402.33	.....	364.73	6,424.44	.....
Fort Harrison, Mont	16,925.13	6,333.13	.....	985.00	6,198.66	.....
Fort Hancock, N. J	1,511.15	2,917.57	.....	45,130.75	25,722.59	.....
Fort Myer, Va	1,680.00	1,258.32	.....	.....	3,472.50	.....
Fort Porter, N. Y	.....	613.67	.....	.....	25.00	.....
Fort Riley, Kans	650.00	3,099.96	.....	.....	1,574.00	.....
Fort Sheridan, Ill	467.00	3,092.19	.....	.....	.....	.....
Fort Sill, Okla	.....	700.00	.....	.....	8,062.90	.....
Fort Thomas, Ky	1,286.80	1,860.15	.....	754.00	290.00	.....
Fort Washington, Md	148.00	.....	.....	10,000.00	463.00	.....
Fort Wayne, Mich	2,721.94	1,172.08	.....	300.00	556.50	.....
Fort Wingate, N. Mex	8.00	1,133.32	.....	13,804.70	1,668.49	.....
Allegheny Arsenal, Pa	574.95	.....	.....	.....	129.24	.....
Augusta Arsenal, Ga	559.69	6.50	.....	.....	98.36	.....
Benicia Arsenal, Cal	1,288.40	108.40	.....	.....	226.81	.....
Columbia Arsenal, Tenn	764.56	38.00	.....	.....	60.00	.....
Frankford Arsenal, Pa	140.00	10.00	.....	.....	1,026.96	.....
Indianapolis Arsenal, Ind	326.78	.....	.....	.....	.....	.....
Kennebec Arsenal, Me	1,155.00	15.00	.....	.....	25.00	.....
Rock Island Arsenal, Ill	1,283.99	148.06	.....	.....	978.94	.....
Watertown Arsenal, Mass	1,802.36	170.45	.....	.....	884.98	.....
Watervliet Arsenal, N. Y	2,124.56	154.91	.....	.....	122.40	.....
Military attaché, London, England	.....	64.40	.....	72.00	.....	.....
Total	1,849,944.39	549,369.77	130,278.82	655,769.95	1,891,400.27	1,024,297.25

Remitted from regular appropriations, fiscal year 1897—Continued.

Department, etc.	Construction and repair of hospitals.	National cemeteries.	Pay of superintendents of national cemeteries.	Shooting galleries and ranges.	Quarters for hospital stewards.	Military posts.
Department of the East	$43,157.06			$729.65	$1,218.71	$14.00
Department of the Missouri	5,290.72	$15.00		5,082.60	449.15	
Department of Texas	2,389.30			1,108.22	95.48	
Department of the Platte	5,134.15			696.37	405.09	12,000.00
Department of Dakota	2,877.84			74.78	1,136.76	
Department of California	4,035.04			1,097.25	138.31	77,959.25
Department of Colorado	4,649.07			969.79	108.20	
Department of Columbia	1,031.21			215.64	8.00	
Depot at New York		2,073.35	$900.00			
Depot at Philadelphia		4,094.68	2,290.00			
Depot at San Francisco		1,296.86	720.00			
Depot at St. Louis		11,211.50	10,620.00			
Depot at Washington	7.00	39,976.66	21,914.67		3,100.11	
Depot at Jeffersonville		2,188.06	3,840.00			
Jefferson Barracks, Mo	4,370.29					19,472.61
Plattsburg Barracks, N. Y	18.00					42,977.11
Hot Springs, Ark	800.00					
Willets Point, N. Y	163.22				44.60	
Atlanta, Ga		27,006.23	21,595.00			
Spokane, Wash						140.00
Fort Delaware, Del	1,188.00					
Fort Ethan Allen, Vt						7,198.80
Fort Harrison, Mont						4,835.79
Fort Myer, Va					825.00	17,971.51
Fort Wayne, Mich						5,595.48
Rock Island Arsenal, Ill		400.00				
Total	75,110.90	88,262.34	61,879.67	9,974.30	7,529.41	188,164.55

Department, etc.	Repairing roads to national cemeteries.	Headstones for graves of soldiers.	Burial of indigent soldiers.	Fort Wayne Military Reservation.	Road to the national cemetery, presidio of San Francisco, Cal.	Military cemetery at Key West, Fla.
Department of the East						$2,058.00
Depot at New York		$18,170.45				
Depot at San Francisco					$10,000.00	
Depot at St. Louis	$1,058.50					
Depot at Washington	3,858.38	437.00	$2,000.00			
Atlanta, Ga	3,027.40					
Fort Wayne, Mich				$19,861.95		
Total	7,944.28	18,607.45	2,000.00	19,861.95	10,000.00	2,058.00

Department, etc.	Additional lands, Fort Ethan Allen Military Reservation.	Military post, Fort D. A. Russell, Wyo.	Military post, Fort Harrison, Mont.	Military post, Fort Riley, Kans.	Military post, Spokane, Wash.	Total.
Department of the East						$777,138.75
Department of the Missouri						654,165.63
Department of Texas						260,473.61
Department of the Platte						407,424.05
Department of Dakota						443,335.70
Department of California						314,105.54
Department of Colorado						606,793.18
Department of Columbia						213,251.13
Depot at New York						344,606.40
Depot at Philadelphia						1,035,682.29
Depot at San Francisco						114,098.63
Depot at St. Louis						191,609.03
Depot at Washington						239,273.38
Depot at Jeffersonville						228,012.37
Columbus Barracks, Ohio						133.33
Jefferson Barracks, Mo						71,740.32
Plattsburg Barracks, N. Y						134,202.02
Hot Springs, Ark						7,488.17
Little Rock, Ark						6,317.04
Springfield Armory, Mass						2,189.12
West Point, N. Y						42,154.83

Remitted from regular appropriations, fiscal year 1897—Continued.

Department, etc.	Additional lands, Fort Ethan Allen Military Reservation.	Military post, Fort D.A. Russell, Wyo.	Military post, Fort Harrison, Mont.	Military post, Fort Riley, Kans.	Military post, Spokane, Wash.	Total.
Willets Point, N. Y.						$19,133.98
Atlanta, Ga.						57,960.13
Bismarck, N. Dak						2,427.76
Chicago, Ill.						116,114.14
Seattle, Wash						3,709.99
Spokane, Wash					$15,373.33	21,076.29
Fort D. A. Russell, Wyo		$40,000.00				60,584.00
Fort Delaware, Del						22,117.55
Fort Ethan Allen, Vt.	$3,000.00					23,076.34
Fort Harrison, Mont.			$40,000.00			75,277.71
Fort Hancock, N. J.						75,282.06
Fort Myer, Va.						25,207.33
Fort Porter, N. Y.						638.67
Fort Riley, Kans				$28,131.00		33,454.96
Fort Sheridan, Ill.						3,559.19
Fort Sill, Okla						8,762.90
Fort Thomas, Ky.						4,190.95
Fort Washington, Md						10,611.00
Fort Wayne, Mich.						30,207.95
Fort Wingate, N. Mex.						16,609.51
Allegheny Arsenal, Pa						704.19
Augusta Arsenal, Ga.						664.55
Benicia Arsenal, Cal.						1,623.61
Columbia Arsenal, Tenn.						862.56
Frankford Arsenal, Pa						1,176.96
Indianapolis Arsenal, Ind						326.78
Kennebec Arsenal, Me						1,195.00
Rock Island Arsenal, Ill.						2,810.99
Watertown Arsenal, Mass.						2,857.79
Watervliet Arsenal, N. Y						2,401.87
Military attaché, London, England						136.40
Total	3,000.00	40,000.00	40,000.00	28,131.00	15,373.33	6,718,957.63

Remitted from indefinite or special appropriations.

Department, etc.	Military road from El Paso, Tex., to new Fort Bliss, Tex.	Hospital, Fort Meade, S. Dak.	Deportation of refugee Canadian Cree Indians.	Tents for sufferers from floods in the Mississippi River.	Road to national cemetery, Illinois.
Department of Texas	$4,000.00				
Department of the Platte		$106.67			
Department of Dakota			$4,961.28		
Depot at St. Louis				$7,837.97	
Depot at Washington					$15,000.00
Fort Ethan Allen, Vt					
Fort Monroe, Va					
Total	4,000.00	106.67	4,961.28	7,837.97	15,000.00

Department, etc.	Additional land for Fort Ethan Allen Military Reservation.	Sewer system, Fortress Monroe, Va.	Burial of indigent soldiers.	Totals.
Department of Texas				$4,000.00
Department of the Platte				106.67
Department of Dakota				4,961.28
Depot at St. Louis				7,837.97
Depot at Washington			$700.00	15,700.00
Fort Ethan Allen, Vt.	$7,000.00			7,000.00
Fort Monroe, Va.		$9,860.00		9,860.00
Total	7,000.00	9,860.00	700.00	49,465.92

INSPECTION.

The work of the office assigned under this head consists of matters pertaining to the personnel of the officers of the Quartermaster's Department, their assignments to stations, etc., to the clerks and other employees in the office of the Quartermaster-General and in the Quartermaster's Department at large, including those governed by the civil-service rules; also to the preparation of the biennial and annual reports, monthly return of officers, monthly and semimonthly pay rolls of the employees of this office, to the post quartermaster-sergeants, and to the detachment of army service men, Quartermaster's Department, at West Point, N. Y.

The 80 post quartermaster-sergeants and the 116 men composing the detachment of army service men, Quartermaster's Department, are reported to have generally performed satisfactory service during the past fiscal year.

Capt. J. B. Bellinger, assistant quartermaster, commanding the latter organization at West Point, reports, in reference thereto, as follows:

Number of men in detachment July 1, 1896	114
Number of men transferred or discharged during fiscal year ending June 30, 1897	39
	75
Number of men enlisted in and transferred to detachment during fiscal year ending June 30, 1897	37
	112
Number of vacancies in detachment, June 30, 1897	4
Total	116

Captain Bellinger further reports that the members of this detachment are assigned to the following duties: Three as clerks in Quartermaster's and adjutant's offices, 28 as mechanics, 10 as overseers, 25 as teamsters, 32 as laborers, 3 as janitors, 3 as printers, 1 as police sergeant, 1 as gas fitter, 1 as cadets' bugler, 2 as bakers, 1 as gardener, 1 as messenger, 1 as school teacher, 4 vacancies; total, 116.

Under the act of Congress approved March 6, 1896, appropriation is made for the following for the fiscal year ending June 30, 1897:

Detachment of army service men, Quartermaster's Department.

First sergeant	1
Sergeants	6
Corporals	7
Privates	102
Total	116

Cavalry detachment.

First sergeant	1
Sergeants	5
Corporals	4
Farriers	2
Wagoner	1
Saddler	1
Privates	52
Total	66

It is provided, further, in the above act—

That the detachment of enlisted men at the Military Academy, heretofore designated as the general Army service (Quartermaster's Department) and the cavalry detachment, shall be fixed at such numbers, not exceeding two hundred and fifteen enlisted men in both detachments, as in the opinion of the Secretary of War the necessities of the public service may from time to time require. * * *

MONEY ACCOUNTS.

The assignment of work under this head consists of the administrative examination of the money accounts of officers serving in the Quartermaster's Department before their transmission to the Auditor for the War Department.

The following is a statement showing the number of accounts received, examined, and forwarded to the Auditor during the fiscal year ending June 30, 1897:

Received during the year ending June 30, 1897	2,281
Forwarded to the Auditor for the War Department during the year ending June 30, 1897	2,281

RETURNS OF QUARTERMASTER SUPPLIES.

The work under this head consists of the examination of quarterly returns of quartermaster supplies for use of the Army; of annual returns of contingent fund property; of annual returns of supplies for use of militia of the several States and Territories and of the District of Columbia, and a quarterly return of property for improvement and protection of Yellowstone Park, and conducting the correspondence relating thereto. This branch also takes preliminary action on reports of boards of survey and inspection reports from quartermaster depots and independent posts and stations.

The following statement shows the work accomplished during the fiscal year ended June 30, 1897, viz:

Quarterly returns of quartermaster supplies examined	953
Quarterly return of Yellowstone Park property examined	1
Annual returns of militia property examined	48
Annual returns of contingent fund property examined	5
Letters written	2,344

CLOTHING AND EQUIPAGE SUPPLIES.

All work connected with the purchase, manufacture, and issue of clothing and equipage to the Army and to the organized militia of the States and Territories is grouped under this particular heading, of which the following is a summary:

Receipts and expenditures.

The appropriation for clothing and equipage for the fiscal year ending June 30, 1897, was		$1,050,000.00
To which were credited during the last fiscal year the following amounts:		
Reimbursements on account of issues to the militia of the States and Territories		162,855.05
Collections by Pay Department on account of clothing drawn by the enlisted men in excess of their allowance, from purchases of discharges by enlisted men under sec. 4, act of Congress of June 16, 1890, also from sales to officers, to the militia, and surveying expeditions authorized by law		86,262.99
Total		1,299,118.04
The remittances to officers of the Quartermaster's Department at the general depots and elsewhere for the purchase and manufacture of clothing and equipage and other expenditures chargeable to the appropriation for clothing and equipage amounted to	$1,024,297.25	
The amount refunded to the appropriation for arming and equipping the militia on account of clothing and equipage supplies returned to the Quartermaster's Department was	10.00	
		1,024,307.25
Leaving a balance of		274,810.79

In the Treasury of the United States on the 30th of June, 1897, of which but	$241,700.94
Will be required to pay outstanding obligations, leaving an unexpended balance of	33,109.85
To which will be added the collections by the Pay Department after July 1, 1897, and which will be credited to the appropriation for clothing and equipage, estimated at	15,000.00
Making a total of	48,109.85

That will, it is estimated, be covered into the Treasury of the United States.

REMITTANCES.

The following are the amounts that were remitted to officers during the last fiscal year:

Depot at Philadelphia, Pa	$910,748.09
Depot at Jeffersonville, Ind	54,659.29
Depot at San Francisco, Cal	24,114.20
Depot at St. Louis, Mo	10,556.44
Various departments and posts	24,219.23
Total	1,024,297.25

COLLECTIONS BY PAY DEPARTMENT.

There were placed to the credit of the appropriation for clothing and equipage for the fiscal year 1896–97, from collections by the Pay Department, the following amounts, viz:

On account of clothing drawn by enlisted men in excess of their clothing-money allowance	$41,087.51
On account of purchases of discharges by enlisted men under section 4 of the act of Congress approved June 16, 1890, and which, under the decision of the Secretary of War, are placed to the credit of the appropriation for clothing and equipage	8,169.00
Total	49,256.51

Owing to a deficiency in pay, etc., for the Army of 1897, the amount of $8,169, collected and credited to the appropriation for clothing and equipage on account of soldiers' discharges has, upon the application of the Paymaster-General and by authority of the Secretary of War, been reimbursed to the Pay Department since the close of the last fiscal year.

PURCHASES.

The following are the principal articles of clothing, equipage, and materials which were purchased by this Department during the last fiscal year, viz:

Helmets, untrimmed	2,500	Mattresses	4,528
Campaign hats	16,028	Pillows	6,000
Forage caps	37,846	Pillowcases	15,000
Fur gauntlets, pairs	10,098	Iron bedsteads, with bottoms	1,150
Leggings, do	33,042	Barrack chairs	5,441
Undershirts, all kinds	56,338	Corn brooms	38,708
Muslin shirts	177,305	Axes	4,000
Wool stockings, pairs	111,011	Shovels	1,600
Cotton stockings, do	129,091	Scrubbing brushes	20,000
Berlin gloves, do	215,013	D. B. cloth, yards	11,085
Leather gauntlets, do	16,500	S. B. kersey, do	192,040
Boots, do	1,100	D. B. kersey, do	2,797
Shoes, calfskin, do	72,413	Blouse flannel, do	147,969
Barrack shoes, do	224	Shirting flannel, do	25,924
Arctic overshoes, do	14,109	Blouse-lining flannel, do	28,228
Wool blankets	34,669	Canton flannel, do	219,733
Ponchos, rubber	6,116	Cotton duck, all kinds, do	607,847
Bunk bottoms	1,000	Cotton duck, brown, for fatigue clothing, yards	14,345
Mosquito bars	5,000		

MANUFACTURES.

There were manufactured at the Philadelphia, Jeffersonville, and San Francisco depots, from materials purchased under contract, during the last fiscal year, the following articles of clothing and equipage, viz:

Dress coats, all kinds	3,820	Shirts, D. B. flannel	23,516
Overcoats, kersey, made and unmade	5,311	Drawers	32,010
Blouses, made and unmade	37,599	Chevrons, gold lace, all kinds, pairs	5,426
Coats, canvas fatigue	6,336	Chevrons, cloth, all kinds, pairs	14,410
Trousers, canvas fatigue	18,770	Tents, conical wall, improved pattern	250
Trousers, kersey, mounted, made and unmade	15,567	Tents, conical wall, regulation pattern	35
Trousers, kersey, foot, made and unmade	55,397	Tents, hospital	173
Overalls, all kinds	3,580	Tents, wall	723
Stable frocks	3,422	Tents, common	1,209
Pillowcases	4,200	Tents, shelter ....halves..	23,220

ISSUES TO THE MILITIA.

There were issued to the several States and Territories, as specified below, under the provisions of the act of Congress of July 1, 1887, amending section 1661, Revised Statutes, articles of clothing and equipage and other stores, for which the appropriations of the Quartermaster's Department have been reimbursed from that for arming and equipping the militia, as follows:

	Clothing and equipage.	Regular supplies.	Army transportation.
Alabama	$4,134.51	$223.00	.....
Arizona	1,484.21	.....	.....
Arkansas	674.32	.....	.....
Colorado	1,790.89	.....	.....
Connecticut	3,285.77	.....	$26.69
Delaware	1,601.64	.....	.....
District of Columbia	1,998.72	636.38	1.60
Florida	932.93	.....	.....
Georgia	3,452.36	66.00	.....
Idaho	1,771.33	.....	.....
Illinois	2,102.63	.....	.....
Indiana	6,418.85	.....	.....
Iowa	6,946.78	.....	.....
Kansas	5,225.40	60.30	.....
Kentucky	13,532.15	.....	.....
Louisiana	3,469.19	.....	.....
Maine	938.42	.....	.....
Maryland	4,882.01	.....	.....
Michigan	9,918.34	.....	.....
Minnesota	311.03	.....	.....
Mississippi	6,514.85	.....	.....
Missouri	8,469.94	64.00	.....
Nebraska	3,227.95	.....	.....
Nevada	1,311.10	10.93	.....
New Hampshire	2,203.85	.....	.....
New Jersey	32.38	.....	.....
New Mexico	887.40	.....	.....
New York	4,611.06	.....	.....
North Carolina	9,898.93	41.70	8.80
Ohio	4,719.00	.....	.....
Oklahoma	744.45	.....	.....
Pennsylvania	6,681.24	.....	.....
Rhode Island	1,364.19	.....	.....
South Carolina	7,053.74	.....	.....
South Dakota	1,778.07	309.84	.....
Tennessee	7,766.45	.....	.....
Texas	4,459.98	.....	.....
Utah	790.70	.....	.....
Vermont	3,048.61	.....	.....
Virginia	7,675.79	.....	.....
Washington	226.15	.....	.....
West Virginia	1,801.37	.....	.....
Wisconsin	1,886.75	.....	.....
Wyoming	829.62	.....	.....
	162,855.05	1,412.15	37.09
Deduct credit placed to the allotment of the State of Indiana	10.00	.....	.....
Net amount received on account of issues by this Department	162,845.05	1,412.15	37.09

The act of Congress of March 1, 1889, contains a proviso which authorizes the War Department to issue to the militia of the District of Columbia such supplies as can be spared from those procured for use of the Army.

Under this authority there were issued to the commanding general of the District of Columbia militia the following:

Clothing and equipage to the value of	$78.71
Transportation supplies	250.99
Regular supplies	415.09
Total	744.79

The appropriation from which the stores were originally procured will not be reimbursed for the money value of the property thus issued.

CLOTHING FOR DISCHARGED PRISONERS.

There were remitted to various officers during the last fiscal year $4,221.25 for the purpose of purchasing suits of outer clothing at a cost of not to exceed $10 per suit, for issue to prisoners upon release from confinement under court-martial sentences involving dishonorable discharge, as provided by the act of Congress approved March 16, 1896, making appropriations for the support of the Army for the fiscal year ending June 30, 1897.

SALES TO THE MILITIA.

Congress, by section 3 of the act approved February 24, 1897, provided that any State or Territory may, in addition to the stores issued under section 1661 of the Revised Statutes, as amended by act of July 1, 1887, purchase for the use of its National Guard or reserve militia, for cash, at cost at place of sale, such stores and supplies from any department of the Army as, in the opinion of the Secretary of War, can be spared.

Under this authority articles of equipage to the value of $2,592 were sold to the State of Ohio. This amount will be placed to the credit of the appropriation from which procured.

SALES TO THE GEOLOGICAL SURVEY.

There were sold to the Director of the United States Geological Survey, and placed to the credit of the appropriation during the last fiscal year, under the provisions of section 3692, Revised Statutes, for use of surveying parties in the field, tents and appurtenances to the value of $2,091.33.

SALES AT AUCTION.

The amount realized at the general depots of the Quartermaster's Department during the last fiscal year from sales of old pattern and unserviceable articles of clothing and equipage was $18,492.03, all of which has been covered into the Treasury of the United States, credited to miscellaneous receipts, as required by law. The expenses connected with making these sales amounted to $254.10.

ISSUES TO INDIAN PRISONERS OF WAR.

There were furnished by this Department during the last fiscal year to the Apache Indian prisoners of war confined by the military authorities at Fort Sill, Okla., such quartermaster supplies as were considered necessary for their wants, as well as for their wives and children.

The following is a detailed statement showing the expenditures connected with the keeping of these Indians, and which were defrayed from the appropriations for the Quartermaster's Department, viz:

Employees, superintendent, interpreter, and packer	$1,946.00
Fuel	3,046.16
Forage	2,994.99
Clothing and equipage	3,666.91
Total	11,654.06

The expenditures during the previous fiscal year for the same object were $11,768.32.

Of the many subjects considered by this Department in connection with the purchase, manufacture, and issue of clothing and equipage, the following are considered of special interest to the Army:

CAP DEVICES FOR ENLISTED MEN.

A full supply of the new cap devices has been purchased and issued to the entire Army. They seem to give general satisfaction; so much so that steps have been taken to extend the issue of same to the militia of the States. A contract has been awarded under which such ornaments can be purchased as may be needed from time to time during the present fiscal year.

UNDRESS FORAGE CAPS.

The attention of this office having been called to the fact that different manufacturers of the new undress cap for officers were making the shape of the visor at such varying angles from the horizontal as to destroy all uniformity, this office prepared a general order describing the cap more fully, and recommended that the same be published to the Army. No action has been taken upon this recommendation, and the evil complained of still exists at almost every post.

The difficulty of constructing the present pattern undress cap for the enlisted men so as to retain its proper shape has been overcome by using a heavier cloth and better stiffening material for the sides and omitting the heavy lining for the top. The caps now purchased seem to be satisfactory.

BLOUSES.

As heretofore stated, the requisitions for clothing and equipage received at this office, in nearly every instance, call for a very large proportion of unmade blouses of exclusively large sizes, which is done for the purpose of cutting them down so as to make a more stylish fit.

To overcome this constantly increasing practice, which results in unnecessary waste of material, it has been decided to hereafter charge to the enlisted men the actual cost of each size of blouse drawn by them, and instructions to carry the foregoing into effect are contained in the new price list of clothing and equipage published by direction of the Secretary of War, General Orders No. 37, Current Series. This involves the necessity of carrying and accounting for these garments upon the returns of officers according to size. It is hoped that by this course the evil referred to will to some extent be remedied, and it is believed that the difficulty will be entirely overcome so soon as the sizes which this Department is endeavoring to improve shall have been adopted. Several sets of blouses of new and revised patterns, based upon actual measurements taken of several hundred men stationed at the Washington Barracks, D. C., Fort Myer, Va., and Fort Columbus,

N. Y., were manufactured at the Philadelphia depot and tried on the enlisted men at the posts named, as well as at Forts Sheridan, Ill., and Leavenworth, Kans. The result has not been entirely satisfactory, owing to the widely differing views expressed by the officers in command, all agreeing, however, that the garments were a vast improvement upon those now issued. The principal objections were that the blouses did not provide sufficient room for an expansion of the chest. The difficulty of providing a satisfactory garment lies in the fact that if sufficient room is given for the expansion of the chest the back of the garment cannot be made to fit.

However, this Department is still studying the problem involved, and trusts that ere long a satisfactory conclusion will be arrived at.

Steps have also been taken to substitute a different lining for the blouses so soon as the present stock of the garments referred to shall have become exhausted by issues. The present lining consists of a blue flannel, half wool and half cotton, while the new lining is what is known as "lasting." It is an all-wool fabric, black in color, and similar in appearance to the black Italian cloth. It will make a much neater looking garment, and will give equal service with scarcely any increase in cost. Contracts to purchase a supply of this new fabric have already been made.

It has also been decided to hereafter line the sleeves of the blouses with gray silesia instead of unbleached muslin, which no doubt will add to the desirability of the garment.

To utilize the large supply of blouse-lining flannel on hand, it has been decided to dye the same to a dark-blue color and use it in the manufacture of—

OVERCOATS.

These garments are made of kersey and have heretofore been provided simply with a body lining, leaving the skirts of the coats without any lining whatever, thus giving very little warmth to the wearer below the waist. The overcoats hereafter manufactured and issued will be lined throughout and will undoubtedly be much more desirable.

BUCKSKIN GAUNTLETS FOR OFFICERS AND MEN.

The buckskin gauntlets procured and issued to the enlisted men appear to give general satisfaction. By their adoption the many objections raised against those of former makes have been successfully met. It has been demonstrated that a buckskin is the only material that is really suitable for military purposes. The Department is now looking into the question of establishing a suitable standard gauntlet for use of officers, and steps have been taken to procure light buckskin of such reliable tannage as will make it desirable for officers to procure them for their personal use instead of paying exorbitant prices for an article possessing very little merit.

SHOES.

The most important part of the equipment of the soldier is his foot gear. An ill-shod army is noneffective. It has been the constant aim of this Department to procure and furnish the most comfortable and best marching shoe obtainable. The present shoe was adopted in 1893 and was considered a great improvement upon any previously supplied to the troops. The uppers are made of calfskin weighing from 55 to 60 pounds to the dozen skins, and the materials used in their construction are the best and most durable that can be procured.

Notwithstanding, complaint is occasionally made that the shoes supplied are not what they should be, and the Department finds itself again confronted with a question so difficult to solve and which occupies the best minds of other nations.

It seems well established that the uppers are too heavy and the shape, which is very much like that of a brogan, is more or less objectionable.

Samples of two shapes, more like those worn by civilians, having uppers of reduced weights, viz, 45 to 50 and 50 to 55 pounds to the dozen skins, respectively, lighter linings, and thinner, more flexible shanks, are now being procured. It is the intention, before making any changes, to distribute a limited number of pairs of each to various posts for trial, in order that an intelligent and fair expression of opinion may be had. In the meantime this Department will continue to study the matter from an anatomical standpoint, in the hope that something practicable may be evolved.

UNIFORM FOR THE HOSPITAL CORPS.

The dress uniform for the enlisted men of the Hospital Corps having been abolished under the provisions of General Order No. 37 of 1896, all the dress coats and metallic trimmings pertaining to said corps were ordered into depot—the coats for the purpose of having them refaced and thereby rendered fit for issue to other arms of the service, and the obsolete metallic trimmings with a view to their sale at public auction. This change has necessitated the establishment of—

CLOTH SERVICE CHEVRONS

For the enlisted men of the Hospital Corps, in lieu of those of gold lace heretofore worn upon the dress coats.

DYEING OF PRISONERS' CLOTHING.

In making issues of clothing to general prisoners confined under sentence of court-martial, recourse is had, as far as practicable, to such articles as are obsolete or have become damaged by moth or otherwise. Heretofore this clothing was dyed to a dark-blue color, and prior to issue all military buttons were removed therefrom. Complaints were made, however, that this was not satisfactory, the color not being sufficiently distinct from that worn by the enlisted men of the Army. Steps have been taken so that all this class of clothing is now being dyed to a dark-brown or butternut color.

SUSPENDERS.

The question of improving the quality of the suspenders issued by this Department has also been under consideration, and samples of various kinds have been obtained from manufacturers for future reference. It is contemplated to make a change so soon as the stock on hand at the present time shall have become exhausted.

SHELTER TENTS.

Complaints having been received that the shelter tents are not sufficiently waterproof and that they afford very little protection to the men who have occasion to use them, this office has taken steps to

improve, if practicable, the quality of the material of which they are made.

The tents are manufactured from cotton duck 33 inches wide, weighing from 7½ to 8 ounces to the linear yard. The question involved can readily be solved by making them of heavier cotton duck. But this is objectionable, as the tendency of the times is that the soldier's equipments and burden should be lightened, if possible, and not increased in weight.

The matter is being studied and efforts are being made to obtain a duck of present weight, made of yarn having a firmer twist and being more closely woven.

The desirability of having the tents of a dark-brown color has also been advanced and experiments will be made so as to ascertain whether duck made as indicated and dyed afterwards will not be more satisfactory.

SHELTER TENT AND CLOTHING ROLLS.

At the request of the Surgeon-General of the Army, there were ordered to be manufactured and distributed to the several posts at which the enlisted men of the Hospital Corps are stationed 725 shelter-tent halves, having straps and buckles attached for the purpose of packing therein certain articles of clothing. These tents conform to a model which was designed by the Medical Department. Their cost is $1.94½ each, which includes both material and labor.

The attention of this office was also called, by Capt. Edmund Rice, Fifth Infantry, to a shelter tent and clothing roll combined devised by him, which he claimed possessed superior merits. Upon examination it was found that the tent was simply an exact reproduction of the United States regulation shelter tent, having a few straps attached in which to pack and carry articles of clothing or other necessaries. Captain Rice secured letters patent upon the same, and the royalty demanded being excessive the Secretary of War, upon the recommendation of the Quartermaster-General, decided that no action be taken in the matter until the question of royalty be waived forever. This Department has been advised that Captain Rice has disposed of his patent. An offer to furnish the tents has since been made, but declined.

Maj. Charles W. Williams, quartermaster, U. S. A., on duty at the Philadelphia depot of the Quartermaster's Department, has recently submitted a shelter tent and clothing roll devised by him and differing entirely from that patented by Captain Rice, with a view to having the same patented by the Department, should the features presented possess sufficient merit. The subject will be considered so soon as the material of which the future shelter tents are to be made shall have been finally determined upon, as it may be deemed advisable to also change the dimensions of the tent itself.

IMPROVED CONICAL TENTS.

There were manufactured at the Philadelphia depot during the last fiscal year 250 of the improved conical tents, conforming to the design submitted by Maj. Charles W. Williams, quartermaster, United States Army, and which was patented by him so that the Government could have the benefit of the invention without cost of royalty. A number of them have already been issued, and it is the intention of the Department to issue the remainder to extreme northern posts, when required, and where their use and trial in winter will demonstrate whether the tent should entirely supersede the regulation conical wall tent.

TENTS FOR FLOOD AND CYCLONE SUFFERERS.

The demand for the loan of tents for use of the people who were rendered homeless by the inundations of the Mississippi River during the spring of the present year became so urgent that Congress, by joint resolution, approved March 24, 1897, appropriated sufficient funds to purchase 1,000 tents to shelter and relieve the sufferers referred to. Under this authority there were purchased, after public competition, the number of tents authorized, at a cost of $7,837.97. There were at the St. Louis, Mo., depot 348 additional tents, which were left on hand from those purchased under previous joint resolution of Congress granting relief on similar occasions, making a total of 1,348 available tents. Nearly all of these were distributed to Memphis, Helena, and Vicksburg, at a cost of $779.63 on account of transportation, pay of agents, etc., and which must be defrayed from the appropriations for the support of the Army.

Efforts have been and are being made to return the tents to the custody of this Department. From reports received it appears that 421 are still outstanding. Whether any or all of these will be returned is problematical. An additional expense of $313.09 has thus far been incurred on this account.

There were also loaned in May last by authority of the Secretary of War to the citizens of El Paso, Tex., who were rendered homeless by the inundations of the Rio Grande River such tentage as could be spared from that in possession of the troops at Fort Bliss, Tex. None of the tents have thus far been returned, and it is doubtful whether the same can ever be utilized for military purposes hereafter.

Under authority of the Secretary of War of April last, there were loaned to the cyclone sufferers at Chandler, Okla., 30 tents belonging to the garrison at Fort Reno, Okla.

TENTS FOR REUNION OF THE GRAND ARMY OF THE REPUBLIC.

Congress, by Public Resolutions Nos. 18 and 19, having authorized the loan of tents to the reunions of the Grand Army of the Republic to be held at Buffalo, N. Y., and Leavenworth, Kans., the available flood-sufferer tents will be made use of. Applications for the use of these tents from other military organizations are pending.

BAND INSTRUMENTS.

In order to ascertain the amount of money that will annually be needed to supply the various military bands with instruments of the best domestic production, a careful register of issues to each particular band is kept in this office. It appears that there were expended during the last three fiscal years the following amounts, viz:

1894–95	$11,259.96
1895–96	8,999.63
1896–97	6,827.13
Total	27,086.72

The above does not include the cost of repairing the instruments already in possession of the bands, but it may safely be assumed that the annual expenditures in connection with the instruments will be about $10,000.

HAND LITTERS.

There were purchased during the last fiscal year 400 hand litters, conforming to model furnished this office by the Surgeon-General of the Army, of which 276 have been issued to companies as required by paragraph 1417 of the regulations.

Judging from a few reports which have recently reached this office, it would seem that the braces are not sufficiently strong. Steps have been taken to remedy the defect.

SPADES, SHOVELS, AND AXES.

Finding that the shovels and spades purchased by this Department were of a pattern which had become antiquated, samples of latest production were procured and adopted as the future standards for the Army. Specifications conforming thereto were also approved.

The specifications for axes have also been amended so as to provide that axes hereafter to be procured shall be of soft steel instead of extra refined iron.

COLORS AND FLAGS FOR THE SECRETARY OF WAR.

A silken color and bunting flag having by General Orders, No. 10, current series, been established for use of the Secretary of War, standard samples and specifications have been adopted. Both color and flag are of scarlet, and the design consists of an eagle with outspread wings and a star in each of the four corners.

CLOTHING REGULATIONS.

Under paragraph 1548 of the regulations of 1895, the uniform and equipments of officers and enlisted men are to be prescribed in special regulations and published by authority of the Secretary of War. This necessitated a compilation of the regulations and decisions relating to the uniform that existed at the time the Army regulations went into effect, to which were added such changes as had been made to date. This compilation having been approved by the Secretary of War, the same has been published in pamphlet form and distributed in the usual manner.

CONCLUSION.

The quality of clothing and equipage issued to the Army has been fully up to requirements. Scarcely any complaints upon the general character of the articles supplied have been received, and all demands made upon the Department have been met with promptness.

In conclusion I respectfully refer to the accompanying statement showing in detail the quantities on hand at the general depots of the Quartermaster's Department on the 30th of June, 1896, the quantities purchased, manufactured, sold, issued to the Army and to the militia, and such other data as will convey full information as to the supplies that were available at the beginning of the present fiscal year.

Very respectfully,

JAMES GILLISS,
Deputy Quartermaster-General, United States Army.

The QUARTERMASTER-GENERAL.

A.—*Statement showing articles of clothing and equipage and material on hand at the issuing depots of the Quartermaster's Department June 30, 1896, the quantities purchased, manufactured, received from posts and depots, taken up, sold, transferred to general depots, expended, issued to the Army and the Militia, and the quantities remaining in depots June 30, 1897.*

Articles.	On hand June 30, 1896.	Purchased.	Manufactured.	Received from general depots.	Received from posts.	Gained.	Total received.	Sold.	Transferred to general depots.	Expended or dropped.	Issued to the Militia.	Issued to the Army.	Total issued.	Remaining on hand June 30, 1897.
Clothing.														
Aiguillettes and shoulder knots..sets..	1,664	1,050	.....	.....	4	.....	2,718	9	.....	.....	165	222	396	2,322
Blankets, woolen	42,447	34,669	.....	17,000	66	.....	94,182	37	10,501	615	1,967	17,069	30,189	63,993
Blouses:														
Made	51,841	.....	10,002	8,500	779	.....	71,122	435	9,324	.....	8,167	9,749	27,675	43,447
Unmade	7,432	.....	27,597	6,549	54	.....	31,632	23	5,725	.....	312	23,199	29,259	2,373
Blouse trimmings.....sets..	.....	.....	831	.....	.....	.....	831	.....	.....	.....	.....	.....	831	.....
Boots, sewed.....pairs..	11,518	1,100	.....	1,075	43	.....	13,736	8	1,075	.....	82	2,225	3,390	10,346
Brassards	1,269	.....	1,107	1,175	3	.....	3,554	3	1,050	2	172	1,228	2,455	1,099
Caps:														
Canvas	3,774	.....	2,775	3,300	2	.....	9,851	3	3,425	.....	.....	2,855	6,283	3,568
Forage, new pattern	35,358	37,846	.....	28,437	2	.....	101,643	200	25,232	12,354	14,637	34,529	86,952	14,691
old pattern	16,885	.....	.....	.....	410	12,354	29,649	23,970	.....	.....	1,499	378	25,847	3,802
Fur	16,154	3,960	.....	8,538	64	.....	28,706	36	11,050	.....	.....	6,140	17,226	11,480
Cap ornaments:														
Old style (all kinds)	292,847	.....	.....	10,000	80,874	1,088	384,809	321,159	9,500	.....	37,462	12,626	380,747	4,062
New style (all kinds)	.....	92,412	.....	4,958	.....	.....	97,370	.....	4,958	.....	290	50,361	55,609	41,761
Chevrons:														
Gold lace.....pairs..	3,351	.....	5,426	5	203	.....	8,985	323	5	91	453	4,807	5,679	3,306
Cloth.....do....	14,566	.....	14,410	7,465	330	.....	36,771	279	7,467	.....	3,378	11,286	22,360	14,411
Coats:														
Canvas fatigue	22,366	.....	6,336	8,600	413	.....	37,715	49	8,600	.....	.....	11,309	19,958	17,757
Summer sack	7,381	.....	9,570	2,350	108	.....	19,409	4	2,355	.....	.....	8,616	10,975	8,434
Uniform dress—														
Musicians, made	1,374	.....	393	90	34	.....	1,891	16	90	20	232	189	547	1,344
unmade	1	.....	1	.....	.....	3	5	.....	.....	.....	.....	2	2	3
Noncommissioned officers', made	128	.....	.....	.....	.....	.....	128	.....	.....	.....	.....	61	61	67
Noncommissioned officers', unmade	19	.....	.....	.....	.....	.....	19	.....	.....	.....	.....	19	19	.....
Privates', made	8,218	.....	3,426	2,177	429	.....	14,250	123	2,179	44	317	4,166	6,829	7,421
unmade	3,444	.....	1	11	278	368	4,102	350	14	40	.....	179	583	3,519
Coat facings .....sets..	8,829	.....	1,197	27	3,822	.....	13,875	1,939	3,241	98	104	497	5,879	7,996
Collars, linen	312,042	105,089	.....	100,900	8	.....	518,039	337	90,900	.....	.....	102,729	193,966	324,073
Drawers:														
Canton flannel.....pairs..	84,372	.....	32,010	38,500	53	.....	154,935	105	38,500	.....	.....	63,743	102,348	52,587
Knit wool .....do....	27,489	.....	.....	2,500	24	.....	30,013	25	2,500	.....	.....	5,205	7,730	22,283
Frocks, stable	7,773	.....	3,422	2,600	392	.....	14,187	1	2,600	.....	48	3,971	6,620	7,567

A.—*Statement showing articles of clothing and equipage and material on hand at the issuing depots, etc.*—Continued.

Articles.	On hand June 30, 1896.	Purchased.	Manufactured.	Received from general depots.	Received from posts.	Gained.	Total received.	Sold.	Transferred to general depots.	Expended or dropped.	Issued to the Militia.	Issued to the Army.	Total issued.	Remaining on hand June 30, 1897.
Clothing—Continued.														
Gauntlets:														
Fur.....pairs..	13,921	10,098	.....	7,500	40	29	31,588	22	7,500	.....	.....	13,085	20,607	10,981
Leather (old style).....do....	11,603	721	.....	252	372	7	12,955	5,921	253	1	214	6,209	12,598	357
(new pattern).....do....	918	16,500	.....	.....	.....	.....	17,418	100	4,620	.....	160	9,018	13,898	3,520
Gloves, Berlin.....do....	218,832	215,013	.....	159,400	62	.....	593,307	208	159,400	.....	9,563	182,038	351,209	242,098
Hats, campaign.....	56,022	15,028	.....	24,796	43	207	96,096	4,586	24,800	7	5,967	23,151	58,511	37,585
Cords and tassels for.....	18,955	.....	.....	.....	294	632	19,881	3,413	.....	.....	14	434	3,861	16,020
Helmets:														
Cork.....	13,181	3,195	.....	6,500	74	.....	22,950	63	6,500	.....	859	3,925	11,347	11,603
Untrimmed.....	17,691	2,500	.....	8,214	59	.....	28,464	95	8,180	.....	949	6,263	15,487	12,977
Cords and bands for.....	4,141	5,000	.....	1,900	2	.....	11,043	61	1,900	.....	235	1,713	3,909	7,134
Eagles for.....	16,001	24,800	.....	6,200	26	.....	47,027	7	6,200	.....	865	5,667	12,739	34,288
Eagle devices for.....	2,255	2,000	.....	11	1,122	1,513	6,901	501	500	.....	156	1,190	2,347	4,554
Hair plumes for.....	6,598	8,000	.....	1,820	10	.....	16,788	.....	1,820	.....	204	1,509	3,533	13,255
Numbers for.....	141,247	.....	.....	4,000	678	.....	145,925	.....	4,000	.....	341	7,657	11,998	133,927
Plume sockets for.....	6,773	8,000	.....	2,000	2	1	16,776	.....	2,000	.....	233	1,455	3,688	13,088
Scrolls and rings for.....	12,307	9,000	.....	3,000	.....	.....	24,307	.....	1,500	3,918	307	2,290	8,015	16,292
Side buttons for.....	63,391	33,000	.....	11,452	961	.....	108,804	233	12,254	.....	1,754	10,767	24,918	83,886
Spikes for.....	11,873	15,000	.....	4,500	.....	.....	31,373	135	4,500	.....	682	4,200	9,517	21,856
Top bases for.....	16,648	20,000	.....	5,200	.....	.....	41,848	.....	5,200	.....	840	5,706	11,746	30,102
Leggings, canvas.....pairs..	67,292	33,042	.....	25,775	152	.....	126,261	212	25,775	70	13,048	20,576	59,681	66,580
Mittens:														
Canvas.....do....	3,776	.....	2,970	2,735	129	.....	9,610	4	3,000	70	.....	2,357	5,431	4,179
Woolen.....do....	10,832	.....	.....	875	349	.....	12,056	130	875	.....	.....	2,782	3,787	8,269
Music pouches.....	864	344	.....	25	7	.....	1,240	1	25	1	40	205	272	968
Neckties.....	24,613	.....	.....	7,800	.....	.....	32,413	36	7,800	.....	.....	5,871	13,707	18,706
Overalls:														
Engineers'.....pairs..	604	.....	4	.....	.....	.....	608	.....	.....	.....	.....	.....	.....	608
Mounted.....do....	17,836	.....	3,576	4,750	361	.....	26,523	1,186	4,751	.....	20	4,660	10,617	15,906
Overcoats:														
Buffalo.....	2,030	.....	.....	.....	482	.....	2,512	.....	.....	.....	2	2	4	2,508
Canvas (blanket lined).....	3,109	.....	2	.....	.....	.....	3,111	641	.....	.....	.....	196	837	2,274
Kersey, made.....	13,811	.....	4,432	1,316	199	.....	19,758	1,823	1,317	1	1,855	7,061	12,057	7,701
unmade.....	1,662	.....	879	1,736	50	.....	4,327	60	1,736	70	.....	1,211	3,077	1,250
Overcoat cape linings.....	3	.....	619	.....	.....	35	657	63	.....	.....	.....	457	520	137
Overshoes, arctic.....pairs..	16,146	14,109	.....	11,054	66	.....	41,375	5,548	11,054	.....	.....	10,854	27,456	13,919
Ponchos, rubber.....	4,227	6,116	.....	4,000	.....	.....	14,343	120	4,000	10	1,250	4,581	9,961	4,382
Shirts:														
Flannel, dark blue, made.....	36,006	.....	23,516	21,300	82	.....	80,904	53	21,300	*	125	32,064	53,542	27,362
Flannel, dark blue, unmade.....	48	.....	.....	.....	2	.....	50	10	2	.....	.....	.....	12	38

Muslin	165,431	177,305	.....	93,354	21	.....	436,111	43	79,194	.....	.....	39,499	118,736	317,375
Shirt studs, bone	91,560	.....	.....	.....	4,370	.....	95,930	36	.....	10	.....	1,283	1,329	94,601
Shoes:														
Barrack ....pairs..	59,768	224	.....	10,166	345	.....	70,503	30	10,166	7	.....	13,237	23,490	47,013
Calfskin....do....	44,679	72,413	.....	33,340	46	.....	150,478	58	33,662	.....	3	148,080	81,803	68,675
Stockings:														
Cotton....do....	386,397	129,091	.....	190,480	39	.....	706,007	261	115,480	.....	.....	63,617	279,358	426,649
Woolen....do....	164,694	111,011	.....	63,400	297	100	339,502	126	63,400	.....	.....	82,761	146,287	193,215
Suspenders....do....	23,166	6,000	.....	3,000	83	.....	32,249	83	3,000	.....	.....	7,193	10,276	21,973
Trousers:														
Canvas fatigue....do....	12,498	.....	18,770	15,300	390	.....	46,958	50	15,300	.....	94	16,146	31,590	14,363
Foot, made....do....	25,137	.....	31,368	12,800	696	.....	70,001	804	12,800	.....	9,841	22,209	45,654	24,347
unmade....do....	6,233	.....	24,029	15,617	25	.....	45,904	121	15,617	10	334	18,928	35,010	10,894
Mounted, made....do....	22,347	.....	5,028	4,460	198	.....	32,033	5,396	4,460	.....	105	5,909	15,870	16,163
unmade....do....	6,805	.....	10,539	9,172	258	.....	26,774	89	9,172	.....	.....	8,487	17,748	9,026
Summer....do....	6,331	.....	15,649	5,000	.....	.....	26,980	9	5,000	.....	1,528	13,187	19,724	7,256
Trousers stripes:														
Corporals'....pairs..	7,566	.....	18,498	10,400	3	182	36,649	91	10,400	.....	3,447	11,688	25,626	11,023
Hospital corps and noncommissioned staff....pairs..	525	.....	2,664	1,850	19	.....	5,058	1	1,850	.....	94	1,737	3,682	1,376
Sergeants'....do....	5,998	.....	11,031	6,700	135	.....	23,864	425	6,727	.....	1,712	7,242	16,106	7,758
Trousers trimmings....sets..	.....	.....	2,188	.....	.....	.....	2,188	1	.....	.....	2,187	.....	2,188	.....
Undershirts:														
Cotton	150,287	56,338	.....	81,150	.....	.....	287,775	22	66,870	.....	.....	60,028	126,920	160,855
Woolen	131,699	.....	.....	25,400	529	.....	157,628	82	25,400	.....	.....	29,218	54,700	102,928
Equipage.														
Axes	4,547	4,000	.....	500	3	.....	9,050	1	500	.....	99	2,715	3,315	5,735
Ax helves	6,277	4,050	.....	.....	.....	.....	10,327	2	.....	.....	148	8,376	8,526	1,801
Ax slings	1,166	.....	.....	.....	.....	2	1,168	814	.....	2	.....	32	848	320
Bags, barrack	1,961	.....	4,258	3,200	.....	.....	9,419	3	3,200	.....	50	2,691	5,944	3,475
Bed sacks	1,850	.....	2,716	1,750	.....	1	6,317	80	1,750	.....	1,000	1,449	4,229	2,088
sheets	41,766	9,661	200	11,500	.....	.....	63,127	212	11,500	.....	898	18,544	31,154	31,973
Bedsteads with woven-wire bottoms	1,997	1,150	.....	1,560	.....	240	4,947	278	1,570	65	12	1,259	3,184	1,763
Books:														
Company letters received	363	500	.....	69	.....	.....	932	.....	69	.....	1	86	156	776
Index	237	350	.....	59	.....	.....	646	.....	59	.....	1	95	155	491
Company letters sent	365	300	.....	80	.....	.....	745	.....	80	.....	1	126	207	538
Index	263	300	.....	58	.....	.....	621	.....	58	1	1	124	184	437
Company order	405	550	.....	199	.....	.....	1,154	.....	174	1	22	215	412	742
Post council of administration	274	.....	.....	10	.....	.....	284	.....	10	.....	.....	21	31	253
Post letters received	155	200	.....	42	.....	.....	397	.....	38	2	6	85	131	266
Index	146	175	.....	47	.....	.....	368	.....	43	.....	6	91	140	228
Post letters sent	146	175	.....	42	.....	.....	363	.....	38	.....	5	57	100	263
Index	141	175	.....	49	.....	.....	365	.....	45	.....	5	68	118	247
Post order	350	.....	.....	20	.....	.....	370	.....	20	.....	.....	43	63	307
Regimental letters received	85	50	.....	18	.....	.....	153	.....	10	.....	5	18	33	120
Index	71	60	.....	30	.....	.....	161	.....	28	.....	5	24	57	104
Regimental letters sent	93	50	.....	15	.....	.....	158	.....	10	.....	5	15	30	128
Index	88	50	.....	25	.....	.....	163	.....	20	.....	5	19	44	119
Regimental order	95	50	.....	10	.....	.....	155	.....	10	.....	.....	9	19	136

A.—*Statement showing the articles of clothing and equipage and material on hand at the issuing depots, etc.*—Continued.

Articles.	On hand June 30, 1896.	Purchased.	Manufactured.	Received from general depots.	Received from posts.	Gained.	Total received.	Sold.	Transferred to general depots.	Expended or dropped.	Issued to the Militia.	Issued to the Army.	Total issued.	Remaining on hand June 30, 1897.
Equipage—Continued.														
Brooms, corn	16,321	38,708					55,029	34		379		26,844	27,257	27,772
Brushes, scrubbing	7,393	20,000		10,400			37,793	14	10,400	144		13,335	23,893	13,900
Bugles	61	14		9			84	6	9		7	25	47	37
Bunks, iron	906			400	1,490		2,796	1,512				999	2,511	285
Card holders for	4,316	6,500		4,500			15,316		4,500			2,754	7,254	8,062
Woven-wire bottoms for	4,968	1,000		1,000	477		7,445	509	1,000			1,795	3,304	4,141
Chairs, barrack	2,347	5,441		600			8,388	70	6	10		3,582	3,668	4,720
Colors:														
Camp	276			100			376		100	5	4	77	186	190
National	13	70					83			9	7	65	81	2
Regimental	6	26					32			5	1	22	28	4
Colors and guidons:														
Belts and slings for	14	20			1		35				4	1	5	30
Cases for	17						17							17
Staffs for	121	66			4		191	69			8	34	111	80
Drums	114	100		61	4	1	280		61		21	30	112	168
Drum cases	70		2	20		41	133		20		19	6	45	88
cords	13	96					109					74	74	35
Drum heads, batter	303	438		50			791	10	52		54	137	253	538
snare	314	726		100			1,140	8	75	1	45	159	288	852
knee rests	11	40					51	6					6	45
rods	310	50					360					28	28	332
slings	538			50			588	7	50		146	34	237	351
snares ..... sets	2,634						2,634			144		17	161	2,473
sticks ..... pairs	3,118	1			3		3,122	30		6	31	30	97	3,025
stick carriages	2,315				2		2,317				18	9	27	2,290
Fifes	1,235				6		1,241	150			18	19	187	1,054
Flags:														
Garrison	123	8		20			151	2	20	10	2	23	57	94
Hospital, field	38	5					43			1		7	8	35
general	14	1					15			3		1	4	11
Post	623	28		105			756	24	113	21	16	138	312	444
Storm and recruiting	982	310		253	1		1,546	44	261	15	9	231	560	986
Flag halyards:														
Garrison and post	227	51		75			353	3	77	3	12	86	181	172
Recruiting	1,696			3	1		1,700	1				10	11	1,689
Flag halyard devices	2,452						2,452							2,452
Guidons:														
Ambulance	13	8					21			1		10	11	10

Artillery, cavalry, and Indian scouts	28	80			2		110			1	5	78	84	26
Hatchets	8,521			500	11		9,032	5	500	3	76	1,322	1,906	7,126
Helves for	7,839	2,000		1,500	23		11,162	1	1,500		74	3,703	5,278	5,884
Slings for	955						955	890			2	40	932	23
Kettles, camp	3,065			300			3,365	18	300	62	196	665	1,241	2,124
Litters, hand (new pattern)	4	400					404	4			10	262	276	128
Mattresses	1,740	4,528		3,540	16	1	9,825	91	3,822	19	12	4,514	8,458	1,367
Covers for	21,994	1,207		3,500	38		26,739	108	3,500		24	6,403	10,035	16,704
Mess pans	45,152						45,152	8,503	50	45	103	669	9,370	35,782
Mosquito bars	11,575	5,000		3,500			20,555	2,577	3,500	2	224	4,619	10,922	9,633
Mosquito head nets	750	1,425					2,175	9				339	348	1,827
Pickaxes	2,551			250			2,801	3	250	1	16	576	846	1,955
Helves for	5,491			500			5,991	1	500	2	16	1,474	1,993	3,998
Slings for	188						188	45				20	65	123
Pillows	4,321	6,000		4,200	16		14,537	63	2,760	2	12	4,757	7,594	6,943
Cases for	38,656	15,000	4,200	23,000	34		80,890	197	23,000		24	27,362	50,583	30,307
Pillow sacks	2,234					149	2,383	146				130	276	2,107
Pots, iron	407				2		409	274				24	298	111
Shovels	7,472	1,600		100	1	6	9,179	13	100	13	38	1,854	2,018	7,161
Spades	10,253						10,253	28		8	38	629	703	9,550
Slings for	183						183	44				90	134	49
Standards		6				6	12			1		3	4	8
Stencils:														
Alphabets	42						42					13	13	29
Boxes (complete)	200			45	6		251	1	45		1	51	98	153
Company marking stamps	22	10		1	4		37	1				9	10	27
Numbers	62						62					10	10	52
Tents:														
Common	3,231		1,209	200	232		4,872	191	200		1,155	236	1,782	3,090
Conical wall	567		285		25		877	14		4	70	206	294	583
Hospital	199		173	88	1		461	12	96		107	20	235	226
Shelter (halves)	10,930		23,220	7,202			41,352	2,513	7,202	200	736	10,229	20,880	20,472
Sibley	179						179							179
Wall	831		723	400	20		1,974	70	420		401	141	1,032	943
Tent chains	696						696			50	12	52	114	582
Tent flies:														
Hospital	269		373	166	11		819	13	182	2	263	29	489	330
Wall	814		1,148	450	72		2,484	82	542		717	202	1,543	941
Tent pins:														
Iron, large	2,183						2,183					252	252	1,931
small	4,291						4,291					1,000	1,000	3,291
Wooden (all kinds)	149,430	370,835			256		520,521	14,404	74		87,662	193,006	295,146	225,375
Tent poles:														
Common, ridge	5,849			200			6,049	58	200	113	440	881	1,692	4,357
upright	10,325			400			10,725	150	400	93	2,040	524	3,207	7,518
Conical wall and Sibley	1,592				25		1,617	12			79	112	203	1,414
Hospital, ridge	618	200			2		820	3			128	12	143	677
upright	1,333	400			2		1,735	4			256	25	285	1,450
Shelter	9,386	21,000		1,000			31,386	1,600	1,000	15	736	4,656	8,007	23,379
Wall, ridge	1,240	1,000			20	107	2,367	24	1	2	473	90	590	1,777
upright	2,398	2,000			40	71	4,509	46	2	4	946	175	1,173	3,336

A.—*Statement showing articles of clothing and equipage and material on hand at the issuing depots, etc.*—Continued.

Articles.	On hand June 30, 1896.	Purchased.	Manufactured.	Received from general depots.	Received from posts.	Gained.	Total received.	Sold.	Transferred to general depots.	Expended or dropped.	Issued to the Militia.	Issued to the Army.	Total issued.	Remaining on hand June 30, 1897.
Equipage—Continued.														
Tent-pole sockets	209			50			259		50			15	65	194
rings	5,088			50			5,138		50		6	15	71	5,067
slips, metal	41,631	43,500		450			85,581		450	43,578	600	4,301	48,929	36,652
straps	1,134				25		1,159	12		5	73	96	186	973
stoves	3,010	256					3,266			10	102	70	182	3,084
stovepipe joints	6,215						6,215				610	895	1,505	4,710
tripods	702				25		727	12			88	96	196	531
Trumpets	1,255	400		765	2	2	2,424	178	765		277	372	1,592	832
cords and tassels for	1,110	2,200		1,225	1	4	4,540	2	1,225	2	291	696	2,216	2,324
crooks for	1,028			150	2		1,180	370	150	2	65	67	654	526
mouthpieces for	125	250		22			397		22	70	6	51	149	248
Whistles	1,336						1,336	3	10			183	196	1,140
MATERIALS.														
Buttons, all kinds number	2,021,036	3,935,376		391,578	1,788	2,704	6,952,482	89,586	407,418	2,624,784	6,318	414,371	3,542,477	3,410,005
Cloth:														
Blanket lining yards	6,914			1,102	64	805	8,885	1		46	30	956	1,033	7,852
Dark blue do	17,716	11,085		1	1,614		30,416	102	2,377	6,559	3,499	999	13,536	16,880
Facing do	8,563	8,111		397			17,071	31	398	3,591	6		4,026	13,045
Italian do	6,900	6,000					12,900	49		1,794	1,700	20	3,563	9,337
Doeskin, sky blue do	7						7							7
Drilling do	65,245	107,425		8,068			180,738	6	8,068	91,670		10	99,754	80,984
Duck:														
Brown do	51,513	114,345		28,505			194,363	18	28,506	97,101	50		125,675	68,688
Bleached and unbleached (all kinds) yards	280,775	607,847		14,532			903,154	81	14,548	379,445	185	674	394,933	508,221
Flannel:														
Blouse, dark blue do	199,992	147,969		80,568	521		429,050	310	130,580	79,793	3,396	1,419	215,498	213,552
lining, dark blue do	137,566	28,228		50,347	43		216,185		85,358	42,027	870	498	128,753	87,432
Canton do	133,933	219,733		79,163	44		432,873	26	79,163	70,890		3,709	153,788	279,085
Shirting and cape lining do	35,619	25,924		51,059	34		112,636	126	791	31,509		319	32,745	79,891
Jeans, corset do	96,125	40,048		5,517			141,690	357	10,517	41,365	1,050	91	53,380	88,310
Kersey:														
Dark blue do	6,290	2,797					9,087	8		2,310			2,318	6,769
Gray do	936						936							936
Sky blue do	140,958	192,040		3,201	120		336,319	227	3,002	128,911	4,309	1,506	137,955	198,364
Lace, gold do	2,703	6,017		600			9,320		600	6,696			7,296	2,024
Muslin, unbleached do	132,626	19,809					152,435			29,411	290		29,701	122,734

Padding	do	130,978	3,500		3,982			138,460	4	3,982	48,694	290		52,970	85,490
Silesia	do	80,426	9,876					90,302			20,824	145	171	21,140	69,162
BAND INSTRUMENTS AND PARTS THEREOF.															
Instruments.															
Altos		6	21					27				5	21	26	1
Baritones		4	13					17				1	13	14	3
Bassos		2	17				2	21				4	15	19	2
Clarionets		4	21					25	1				17	18	7
Cornets		9	25			1		35				7	24	31	4
Cymbals	pairs	2	7					9				1	6	7	2
Drums, bass		3	10					13				3	10	13	
Flutes		3	3					6					3	3	3
Piccolos		1	5			1		7					5	5	2
Triangles		1						1							1
Trombones		5	12		1			18				5	11	16	2
Parts.															
Bags		79		42			10	131					131	131	
Cases			5					5					5	5	
Cords, bass drum		14	50				4	68					22	22	46
Heads, bass drum		128	62					190					59	59	131
Music holders			37				1	38					36	36	2
Music stands		139	500					639				12	277	289	350
Pads		7,705	144					7,849					5,047	5,047	2,802
Reeds		1,185	4,458					5,643					3,127	3,127	2,516
Springs		884	323					1,207					855	855	352
Sticks, bass drum		8	1					9					5	5	4

REPORT OF MAJ. CHARLES BIRD, QUARTERMASTER, UNITED STATES ARMY.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., August 13, 1897.

GENERAL: I have the honor to submit herewith the following report of the operations of the supplies and transportation division of the office during the fiscal year ended June 30, 1897:

TRANSPORTATION BRANCH.

The Quartermaster-General supervises and controls, through the transportation branch, the equipment for the transportation service of the Army, including wagons, ambulances, and vehicles, draft and pack animals, and cavalry and artillery horses.

Through it he also drafts all regulations and promulgates and enforces instructions for the government of the transportation service for the Army—rail, water, wagon, and stage. All transportation accounts which for legal or technical reasons can not be paid by disbursing quartermasters under existing regulations are settled through this branch, including the voluminous accounts of the bond-aided Pacific railroads.

Telegraph and telephone accounts for military service under similar conditions are settled through this branch.

Estimates of funds for the maintenance of these features of military administration are prepared and their economical expenditure under existing laws and regulations is directed through the transportation branch of this office.

The following statement shows that during the fiscal year 1897 transportation was furnished for 371,611 persons, 4,295 animals, and 98,590 tons of material:

	Railroad.	Water.	Wagon.	Stage.	Vessels.	Total.
Passengers:						
Officers	1,967	245	.....	27	26,712	28,951
Men	22,514	4,625	.....	940	314,581	342,660
Total	24,481	4,870	.....	967	341,293	371,611
Animals:						
Horses	3,134	220	.....	.....	165	3,519
Mules	553	217	.....	.....	6	776
Total	3,687	437	.....	.....	171	4,295
Stores (pounds):						
Subsistence	23,635,763	2,279,303	9,720,806	280	2,289,547	37,925,699
Quartermaster	31,779,630	2,285,055	29,183,740	163	2,155,584	65,404,172
Ordnance	24,133,810	11,328,956	2,777,566	42	3,040,944	41,281,318
Medical	723,463	61,524	527,615	.....	34,789	1,347,391
Signal service	363,330	3,067	74,696	45	60	441,198
Miscellaneous	16,855,485	1,702,818	23,009,943	.....	9,212,310	50,780,556
Total	97,491,481	17,660,723	65,294,366	530	16,733,234	197,180,334

MOVEMENTS OF TROOPS.

The principal movements of troops during the year, with cost of same, exclusive of deductions on account of land-grant and bond-aided railroads, have been as follows:

Troops.	Movements.	Cost.
First Artillery	Nine batteries changing station in Department of the East.	$9,099.54
Do	One battery from Department of the East to the Department of Texas.	1,431.50
Do	One battery from Department of the Missouri to Department of the East.	1,229.87
Second Artillery	One battery changing station in Department of the Missouri.	669.45
Do	One battery from Department of the Missouri to Department of the East.	2,195.40
Do	Two batteries changing station in Department of the East.	254.41
Third Artillery	Headquarters, band, and ten batteries from Department of the East to the Department of California.	27,243.34
Do	One battery from Department of Texas to the Department of California.	3,718.79
Fourth Artillery	One battery from Department of the East to Department of the Missouri.	1,713.60
Fifth Artillery	Headquarters, band, and nine batteries from Department of California to Department of the East.	11,535.12
Do	One battery from Department of California to Department of the Missouri.	621.60
Do	One battery from Department of the Columbia to Department of the East.	1,485.88
First Cavalry	Two troops changing station in Department of the Missouri.	1,676.78
Do	One troop changing station in Department of the Colorado.	365.01
Second Cavalry	Two troops from Department of the Colorado to Department of the Missouri.	4,485.03
Third Cavalry	Headquarters and band from Department of the Missouri to Department of the East.	1,363.04
Fourth Cavalry	Two troops from Department of the Columbia to Department of Dakota.	968.12
Do	Four troops changing station in Department of California.	1,681.35
Fifth Cavalry	Two troops changing station in Department of Texas	243.51
Seventh Cavalry	Two troops changing station in Department of the Colorado.	754.79
Eighth Cavalry	One troop changing station in Department of Dakota	315.69
Tenth Cavalry	Two troops changing station in Department of Dakota	835.95
Second Infantry	Detachment from Department of the Platte to Department of Dakota.	649.02
Fourth Infantry	Transfer of regiment from Department of the Columbia to Department of the Missouri.	11,726.62
Fifteenth Infantry	Transfer of regiment from Department of the Missouri to Department of the Colorado.	25,317.94
Sixteenth Infantry	Transfer of regiment from Department of the Colorado to Department of the Columbia.	15,997.15
Nineteenth Infantry	Eight companies changing station in Department of the Missouri.	1,039.25
Twenty-fourth Infantry	Regiment changing station in Department of the Colorado.	19,531.82
Sixth Cavalry	Band and four troops, Fort Myer to Fort Hamilton and return, escort duty for Chinese Viceroy Li Hung Chang.	3,085.95
Available command	Madison Barracks to Oswego, N. Y., and return, centennial of evacuation of Fort Ontario.	637.50
Do	Fort Porter to Fort Niagara and return, centennial of evacuation of Fort Niagara.	50.00
Twenty-first Infantry	Plattsburg Barracks to Burlington and return, reunion of Society of Army of the Potomac.	200.00
Various	Inaugural ceremonies, transportation of troops to Washington and return.	16,381.63
Do	Memorial Day, May 31, New York City and Brooklyn, N. Y.	211.05
Do	Memorial Day, May 31, Chicago, Ill.	247.75
Do	R. G. Shaw memorial, Boston, Mass.	212.96
Do	Dedication of General Grant's tomb, New York City	11,522.90
Do	Dedication of Washington monument, Philadelphia, Pa.	1,941.68
	Total amount expended in the principal movements of troops during the year	182,640.99

SUMMER ENCAMPMENTS AND RIFLE COMPETITION.

From reports received it is shown that there was expended during the fiscal year 1897 in the transportation of troops in connection with summer encampments, practice marches, field maneuvers, and instructions the sum of $22,898.06; also for the transportation of enlisted

men to engage in rifle competition and target practice, the sum of $5,577.59.

Where expended.	Summer camps.	Rifle competition.
Department of California	$642.45	.....
Department of the Colorado	3,402.10	$161.02
Department of the Columbia	64.81	19.00
Department of Dakota	1,083.08	.....
Department of the East	12,381.57	3,337.70
Department of the Missouri	2,845.95	1,660.62
Department of the Platte	2,038.79	120.00
Department of Texas	439.31	279.25
Total	22,898.06	5,577.59

BOND-AIDED PACIFIC RAILROADS.

Six thousand seven hundred and twenty-six persons, 889 animals, and 34,307,732 pounds of freight were transported for the Army over the bond-aided Pacific railroads, their branches, and leased lines during the year. The service performed by each road is shown in the following table:

Company.	Persons transported.	Animals transported.	Freight transported.
			Pounds.
Union Pacific	4,215	544	16,877,556
Central Pacific (branches and leased lines operated by the Southern Pacific Company)	2,210	149	13,896,549
Sioux City and Pacific	301	196	3,533,627
Total	6,726	889	34,307,732

Seventeen hundred and seventy-three accounts of these railroads, aggregating $214,205.75, were received at this office during the year, examined, and transmitted for settlement through the Treasury, as required by law. Of this amount, $122,643.56 inured to the Union Pacific; $90,674.41 to the Central Pacific, branches and leased lines operated by the Southern Pacific Company, and $887.78 to the Sioux City and Pacific Railway Company.

Of these accounts 996, aggregating $31,933.21, were for transportation service performed for other departments of the Government under the law of July 5, 1884, and of this amount $16,534.89 was for service over the Union Pacific, $15,383.15 over the Central Pacific, with its branches and leased lines operated by the Southern Pacific Company, and $15.17 over the Sioux City and Pacific Railway.

The following statement is an analysis of the accounts of these companies for the year, showing amounts for troops and stores and for bonded and nonbonded service, respectively:

Company.	Amount of accounts received in Quartermaster-General's Office.	Estimated amount of accounts not rendered.	Proportion inuring for troops.	Proportion inuring for stores.	Proportion subsidized.	Proportion unsubsidized.	Total amount.
Union Pacific	$122,643.56	$18,297.81	$50,522.76	$90,418.61	$134,911.45	$6,029.92	$140,941.37
Southern Pacific Co., operating Central Pacific R.R.	90,674.41	15,150.00	26,378.33	79,446.08	48,013.80	57,810.61	105,824.41
Sioux City and Pacific	887.78	773.66	471.94	1,189.50	1,612.92	48.52	1,661.44
Total	214,205.75	34,221.47	77,373.03	171,054.19	184,538.17	63,889.05	248,427.22

VESSELS IN SERVICE OF THE QUARTERMASTER'S DEPARTMENT.

This Department has kept in service, at points where constant use is required, ten steamboats which it owns. The cost of maintaining these, including repairs, for the year ended June 30, 1897, was $79,894.03, as follows:

Name.	Class.	Tonnage.	When purchased or built.	Cost or estimated value.
General Meigs	Propeller	175	May 11, 1892	$64,436.43
Ordnance	do	97	Sept. 1, 1883	27,870.80
Atlantic	Steam tug	60.31	Oct. 15, 1878	13,865.56
Thayer	Steam launch	32.36	Oct. 8, 1874	7,200.00
Hamilton	do	37.68	Feb. 1, 1875	7,800.00
Monroe	do	62.36	Nov. 30, 1875	15,200.00
Resolute	Steam tug	70.30	Nov. 14, 1879	17,947.46
General McDowell	Propeller	160	Nov. 17, 1886	56,150.00
General Rufus Ingalls	Alcohol-vapor launch	Unknown.	July 29, 1896	4,950.00
General D. H. Rucker	do	Unknown.	do	4,950.00

Name.	By whom employed.	Where employed.	Paid for repairs.	Paid for running expenses.	Total expenses.
General Meigs	Depot quartermaster	New York Harbor	$2,497.66	$12,879.59	$15,377.25
Ordnance	do	do	210.71	8,086.21	8,296.92
Atlantic	Post quartermaster	Governors Island	1,074.26	11,188.53	12,262.79
Thayer	do	do	2,709.64	320.82	3,030.46
Hamiltion	do	Fort Slocum, New York Harbor.	.....	4,420.39	4,420.39
Monroe	do	Fort Adams, R. I	1,307.06	4,196.71	5,503.77
Resolute	do	Boston, Mass	545.88	8,110.92	8,656.80
General McDowell	Chief quartermaster	San Francisco Harbor	1,441.10	20,203.75	21,644.85
General Rufus Ingalls	Post quartermaster	Governors Island	.....	53.10	53.10
General D. H. Rucker	do	Fort Monroe, Va	.....	647.70	647.70
Total			9,786.31	70,107.72	79,894.03

STATEMENT OF CHARTERED VESSELS.

The following is a list of vessels temporarily used at times during the year by charter and hire, showing cost of such service to have been $2,741.37.

Name.	Class.	Tonnage.	Period of service.	
			From—	To—
Sea Queen	Steam tug	100	Dec. 24, 1896	Dec. 24, 1896
Do	do	100	Jan. 14, 1897	Jan. 20, 1897
Urania	Naphtha launch	Unknown.	As desired.	
Nellie	Sloop	10	July 1, 1896	June 30, 1897
Peter B. Bradley	Steam tug	81.94	Nov. 22, 1896	Nov. 24, 1896
			Dec. 5, 1896	Dec. 8, 1896
Alice	do	Unknown	Nov. 2, 1896	Nov. 2, 1896
			Nov. 5, 1896	Nov. 5, 1896
			Nov. 6, 1896	Nov. 6, 1896
Mobile	do	Unknown.	Dec. 18, 1896	Dec. 18, 1896
M. Cahill	Steam launch	Unknown	Sept. 1, 1896	Sept. 2, 1896
			Nov. 16, 1896	Nov. 16, 1896
			June 7, 10, 11, 18, 19, 21, and 22, 1897.	
Ella Andrews	Steam tug	Unknown.	Feb. 2 and 26, 1897.	
D. B. Wood	do	Unknown.	Feb. 4 and 27, 1897.	
Not known	do	Unknown.	Unknown.	
Annie	do	Unknown.	July 1, 1896	Aug. 31, 1896
			Oct. 6, 7, and 10, 1896.	
Sampson	do	Unknown	Oct. 24, 1896	Oct. 24, 1896
			June 17, 18, and 21, 1897.	
Unknown	Sailboat	Unknown.	July, 1896	Sept., 1896
Canby	Steam tug	Unknown.	June 4, 1897	June 4, 1897
N. B. Starbuck	do	70.58	Aug. 27, 1896	Aug. 27, 1896
Dorothy Annan	Propeller	99.26	Sept. 15, 1896	Oct. 12, 1896
Sallie	Steam tug	Unknown.	June 10, 1897	June 23, 1897

Name.	Where and by whom employed.	Rate.	Earnings.	Remarks.
Sea Queen	Chief quartermaster, San Francisco, Cal.	$50 per day	$50.00	Substitute for the General McDowell while disabled.
Do	do	$70 per day	420.00	Substitute for the General McDowell while being repaired.
Urania	Quartermaster, San Diego Barracks, Cal.	$3.50 per trip	59.50	Carrying officers on official visits to men-of-war in San Diego Harbor.
Nellie	Quartermaster, Fort Adams, R. I.	$5 per day	381.00	Replacing Monroe.
Peter B. Bradley	Depot quartermaster, Boston, Mass.	$10 round trip	110.00	Replacing Resolute.
Alice	Quartermaster, Fort Barrancas, Fla.	$15 per day	45.00	Towing and placing targets.
Mobile	do	The trip	30.00	Mobile, Ala., to Fort Gaines, Ala., moving ill soldier (Ordnance Sergeant Benjamin).
M. Cahill	Quartermaster, Governors Island, N. Y.	$20 per day	40.00 20.00 140.00	Setting targets at Forts Hamilton and Wadsworth, New York Harbor.
Ella Andrews	Quartermaster, Jackson Barracks, La.	$10 the trip	20.00	Carrying officers on official visits to men-of-war in harbor.
D. B. Wood	do	$15 the trip	30.00	Do.
Not known	Quartermaster, Key West Barracks, Fla.	The job	40.00	Placing and recovering targets.
Annie	Quartermaster, Fort Monroe, Va.	$3 per hour	412.50	Setting targets.
Sampson	Quartermaster, Fort Preble, Me.	The job	12.00 3.00 12.50	Do. Transporting engineer stores, Portland to Fort Gorges, Me. Setting targets.
Unknown	Quartermaster, Madison Barracks, N. Y.	$10 round trip	94.50	Transporting rations, etc., from post to target range.
Canby	Quartermaster, Fort Canby, Wash.	$19 per day	19.00	Placing targets.
N. B. Starbuck	Depot quartermaster, New York Harbor.	$25 per day	25.00	Towing targets at Fort Wadsworth, New York Harbor.
Dorothy Annan	do	$22 per day	616.00	Replacing Ordnance, undergoing repairs.
Sallie	Quartermaster, Fort Monroe, Va.	$2.50 per hour	161.87	Setting targets.
Total			2,741.37	

ACCOUNTS AND CLAIMS FOR TRANSPORTATION AND TELEGRAPHING.

The records show that 4,260 accounts and claims, amounting to $274,085.87 were received, examined, and transmitted for settlement in this branch during the fiscal year ended June 30, 1897.

Of these, 267 accounts, amounting to $21,207.26, were chargeable to the appropriation for army transportation for the several years in which the services were rendered; 1,773 accounts, amounting to $214,205.75, were for transportation over the bond-aided Pacific railroads, their branches and leased lines; 1,652 accounts, amounting to $32,489.70, (exclusive of 996 accounts of the bond-aided Pacific roads amounting to $31,933.21) were for other Departments of the Government and were payable from the appropriations for the several Departments for which the services were performed; and 568 accounts, amounting to $6,183.16, were for the transmission of telegraphic messages upon official military business.

CAVALRY AND ARTILLERY HORSES.

There have been 888 cavalry and 81 artillery horses provided from funds of the fiscal year 1897, at an average cost for cavalry horses of $133.10 each and for artillery horses of $146 each.

Forty-two team horses and 344 mules were purchased from same funds at a cost of $37,685.53, the average cost of the former being $158.54 each and the latter $90.19 each.

During the fiscal year there were sold and died 1,061 cavalry and artillery horses, 30 team horses, and 305 mules (no other casualties being reported), leaving on hand at the close of the year 6,006 cavalry and artillery horses, 525 team horses, and 3,148 mules.

Animals purchased, sold, died, etc., during the year.

	Cavalry and artillery horses.	Team horses.	Mules.
On hand July 1, 1896	6,004	238	3,082
Purchased	1,063	317	371
	7,067	555	3,453
Sold	871	23	237
Died	190	7	68
	1,061	30	305
On hand July 1, 1897	6,006	525	3,148

Statement of draft and pack animals purchased and disposed of during the fiscal year 1897.

For what department, depot, or post.	Horses.			Mules.			Number of animals sold and died.	
	Number.	Total cost.	Average cost each.	Number.	Total cost.	Average cost each.	Horses.	Mules.
Department of the East	17	$2,641.50	$155.38	16	$1,491.40	$93.21	10	14
Department of the Missouri	5	810.00	162.00	67	5,908.40	88.19	3	48
Department of Dakota	2	400.00	200.00	41	3,435.20	83.79	5	36
Department of the Colorado	3	425.00	141.67	67	5,439.20	81.18	2	76
Department of the Columbia	2	175.00	87.50	12	1,620.00	135.00	3	19
Department of California	.....	.....	.....	52	5,676.00	109.15	2	42
Department of Texas	.....	.....	.....	40	3,156.20	78.91	.....	15
Department of the Platte	1	107.50	.....	48	4,204.23	87.59	.....	49
West Point, N. Y.	6	849.50	141.58	1	96.40	.....	2	1
Washington depot	2	600.00	300.00	.....	.....	.....	1	2
St. Louis depot	.....	.....	.....	.....	.....	.....	.....	2
Philadelphia depot	2	350.00	175.00	.....	.....	.....	1	.....
San Francisco depot	2	300.00	150.00	.....	.....	.....	.....	.....
Benicia Arsenal	.....	.....	.....	.....	.....	.....	.....	1
Willets Point, N. Y.	.....	.....	.....	.....	.....	.....	1	.....
Total	42	6,658.50	158.54	344	31,027.03	90.19	30	305

REGULAR SUPPLIES.

This branch has charge of all matters relating to the procurement and distribution of supplies, stoves and heating apparatus, and repair and maintenance of same, for heating barracks and quarters; of ranges, stoves, and apparatus for cooking; of fuel and lights for enlisted men, guards, hospitals, storehouses, and offices, and for sales to officers; of equipment of bakehouses to carry on post bakeries; of the necessary furniture, text-books, paper, and equipments for the post schools; for the tableware and mess furniture for kitchens and mess halls for enlisted men; of forage and bedding for the public animals of the Quartermaster's Department, and for the authorized number of officers' horses; of straw for soldiers' bedding; of stationery and blank books for the Quartermaster's Department, certificates for discharged soldiers, blank forms

for the Paymaster's and Quartermaster's Departments, and of the necessary correspondence connected with the work of this branch.

This branch has also charge of matters relating to all contracts to which the Quartermaster's Department is a party.

CONTRACTS.

During fiscal year ended June 30, 1897, 1,160 contracts were received, examined, and filed in this office. Seven hundred and fifty-one were for 33,451,210 pounds of oats, 58,212,090 pounds of hay, 7,509,100 pounds of straw, 3,879,300 pounds of bran, 248,163,207 pounds of coal, 5,590,490 pounds of corn, 5,109,990 pounds of barley, 65,444 cords of wood, 7,155 bushels of charcoal, and 40,000 pounds of middlings; 66 for clothing, camp, and garrison equipage; 31 for transportation; 6 for packing boxes; 10 for roadways and sidewalks; 54 for leases; 5 for mineral oil; 12 for water and water supply; 8 for services; 1 for illuminating gas; 12 for printing; 76 for buildings and building material; 24 for plumbing and gas piping; 26 for horses and mules; 13 for heating apparatus; 12 for repair of buildings; 3 for sewerage; 2 for telephones; 1 for repair of steamer; 1 for stoves and ranges; 2 for wagons and wagon parts; 2 for lockers; 6 for tableware and kitchen utensils; 2 for gasoline; 1 for barrels; 1 for tunneling; 3 for drainage; 1 for steel trestle and water tank; 1 for pumping engine and fixtures; 3 for stone walls; 1 for top-soil for parade ground; 2 for grading; 1 for sea wall; 1 for wagonette; 2 for lamps; 2 for remodeling heating plants; 1 for railroad track; 2 for rubber hose; 2 for steel bridges; 1 for headstones; 1 for reservation for interments; 1 for repair of wharf; 1 for railroad trestle; 1 for gas fixtures, globes, etc.; 1 for removal of remains of soldiers; 1 for office furniture; 2 for typewriters; and 1 for artesian well.

PURCHASES AT GENERAL DEPOTS.

The following are the payments made by quartermasters for purchases for the Army at general depots for use thereat, and for shipment elsewhere, during the fiscal year ended June 30, 1897, from appropriations pertaining to that period:

Depots.	Regular supplies.	Incidental expenses.	Barracks and quarters.	Army transportation.	Total.
Jeffersonville	$39,564.17	$3,649.76	$460.25	$22,440.79	$66,114.97
New York	65,090.51	4,780.07	180.42	28,270.63	98,321.63
Philadelphia	15,318.27	589.14	1,069.15	9,260.12	26,236.68
St. Louis	12,018.53	297.86	109.62	29,604.04	42,030.05
San Francisco	14,333.75	2,112.50	18,644.41	11,025.42	46,116.08
Washington	63,380.70	537.45	38.70	4,565.05	68,521.90
Total	209,705.93	11,966.78	20,502.55	105,166.05	347,341.31

TABLEWARE AND KITCHEN UTENSILS.

Total cost of all tableware and kitchen utensils purchased at Philadelphia depot amounted to $8,422.59.

Respectfully,

CHAS. BIRD,
Major and Quartermaster, United States Army.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., August 12, 1897.

GENERAL: I have the honor to submit my report of the work of the construction and repair devision of this office during the past fiscal year:

Congress by the act making appropriations for the support of the Army, approved March 16, 1896, under head of "Barracks and quarters" provided		$750,000.00
In the act making appropriations for fortifications, etc., approved June 6, 1896, it was provided that of the $2,500,000 appropriated for gun and mortar batteries, a sum "not exceeding one hundred thousand dollars may be expended for the construction of necessary buildings connected therewith"		100,000.00
Total		850,000.00
Authorized for construction and repairs	$741,153.82	
Authorized for rent of recruiting stations, lodgings for recruits, etc	19,010.90	
Authorized for labor and for rent of offices, barracks, quarters, etc	89,777.59	
		849,942.31
Balance June 30, 1897		57.69

NEW CONSTRUCTION.

During the year there has been authorized from the barracks and quarters appropriation, for the erection of public buildings at different military posts, consisting of barracks, officers' quarters, storehouses, stables, etc., the sum of $468,183.81.

For the construction and repair of hospitals at military posts already established and occupied, there has been authorized from the appropriation for that purpose expenditures amounting to $74,852.82.

REPAIRS.

There has been authorized for repairs, alterations, and improvements in connection with public buildings, and for the purchase of building materials and tools at various posts, from the barracks and quarters appropriation, expenditures amounting to $272,970.01.

The different military departments, depots, etc., to which the barracks and quarters appropriation has been allotted are shown in the following statement:

Recapitulation of the expenditures authorized for construction, repairs, etc., from the appropriation for barracks and quarters, 1896–97:

Department, depot, etc.	Construction.	Repairs.	Total.
Department of the East	$353,287.43	$101,387.69	$454,675.12
Department of the Missouri	31,344.37	41,487.94	72,832.31
Department of the Platte	19,934.65	21,170.31	41,104.96
Department of Dakota	12,519.30	25,269.21	37,788.51
Department of Texas	11,095.22	22,664.08	33,759.30
Department of the Colorado	27,367.88	31,645.77	59,013.65
Department of California	550.00	11,922.54	12,472.54
Department of the Columbia	1,637.69	9,294.30	10,931.99
Jeffersonville Depot	.....	1,210.00	1,210.00
New York Depot	.....	248.87	248.87
Philadelphia Depot	1,094.25	1,889.90	2,984.15
St. Louis Depot	.....	1,177.08	1,177.08
San Francisco Depot	.....	90.00	90.00
Washington Depot	.....	12.75	12.75
Willets Point	9,353.02	3,227.57	12,580.59
Hot Springs Army and Navy General Hospital	.....	272.00	272.00
Total	468,183.81	272,970.01	741,153.82

The following list shows the different buildings which have been authorized to be constructed at the various posts, the expenditures therefor being included in the foregoing statement under the head of "Construction:"

Post.	Designation.	Material.	Amount authorized.
Department of the East.			
Fort Adams	Wagon shed	Wood	$2,150.00
	Gun shed	do	3,392.50
	Relocator house	do	120.00
Fort Barrancas	Kitchen addition to noncommissioned staff officers' quarters.	do	389.79
	Iron piazzas on barracks	Iron	4,130.00
	Ordnance storehouse	Wood	1,661.61
Fort Delaware	Earth closets	do	1,650.00
Fort Ethan Allen	Ordnance storehouse	Brick	1,399.50
Finns Point	Temporary barracks and earth closet	Wood	1,785.00
Governors Island	Quartermaster's stable	Brick	5,872.00
	1 double set noncommissioned staff officers' quarters.	do	4,412.00
Fort Hamilton	3 double sets noncommissioned staff officers' quarters.	do	12,342.00
Fort Hancock	Administration building	do	9,675.00
	Guardhouse	do	8,295.00
	Quartermaster and subsistence storehouse	do	10,175.00
	Fuel storehouse	Wood	3,375.00
	Shop building	Brick	3,745.00
	Stable	do	8,175.00
	Wagon shed	Wood	2,425.00
	2 double sets noncommissioned staff officers' quarters.	Brick	8,790.00
	4 barracks	do	67,900.00
	Commanding officer's quarters	do	7,725.00
	6 captains' quarters	do	74,370.00
	11 lieutenants' quarters	do	78,375.00
	Quarters for 4 bachelor officers	do	12,028.00
	Engineers' quarters	Wood	1,500.00
			296,553.00
	Less amount charged to military posts		80,000.00
			216,553.00
Key West Barracks	1 addition each to quarters Nos. 4 and 8	Wood	8,821.82
Madison Barracks	1 double set officers' quarters	Brick	13,877.50
	Shelter for hose cart	Wood	41.00
	Ordnance storehouse	Brick	1,435.00
Fort McHenry	Fuel sheds	Wood	176.91
Fort McPherson	Subsistence storehouse	Brick	7,200.00
Fort Myer	Wagon shed	Wood	225.00
	Band stand	do	500.00
Fort Niagara	Wagon shed	do	863.00
	Corral	do	94.95
	Wood shed and shop building	do	576.00
Plattsburg Barracks	3 double sets officers' quarters	Brick	37,800.00
	Extra work on same		1,459.73
	Finishing attics of 9 double sets officers' quarters.	Brick	2,787.12
	Subsistence storehouse	do	7,288.00
Fort Porter	3 double sets officers' quarters	do	16,500.00
	1 double set noncommissioned staff officers' quarters.	do	2,995.00
			19,495.00
	Less amount charged to military posts		7,500.00
			11,995.00
Fort Schuyler	Coal shed	Wood	1,500.00
Fort Thomas	Fitting up basement of wagon shed for use as stable.	Brick	664.00
	Total		353,287.43
Department of the Missouri.			
Jefferson Barracks	2 double sets officers' quarters	Brick	23,920.00
Fort Leavenworth	Bathroom addition to commissary-sergeant's quarters, No. 96.	Wood	91.66
	Fence around shops, etc	do	299.30
Fort Logan H. Roots	Corral fence and wagon shed	do	577.00
	Engineers' quarters	do	1,047.00
	Earth closet for same	do	15.00
	Oil house	Iron	185.00

Post.	Designation.	Material.	Amount authorized.
Department of the Missouri—Continued.			
Fort Reno	Coal shed	Wood	$3,043.61
Fort Sheridan	Cold-storage house	Brick	2,087.00
Fort Sill	Ambulance shed	Wood	78.80
	Total		31,344.37
Department of the Platte.			
Fort Crook	Addition to quartermaster storehouse	Brick	2,912.00
	Oil house	Iron	238.00
	Fence at quartermaster stable	Wood	61.10
	Band stand	do	81.25
Fort D. A. Russell	Two additions each to barracks Nos. 35, 36, 37, 39, 40, 41, 43 and 44, and 1 addition to band barracks, No. 42.	Brick	50,428.00
	Less amount charged to special appropriation		40,000.00
			10,428.00
Fort Meade	Two privies for new officers' quarters	Wood	289.30
Fort Niobrara	Addition of squad room to each of barracks, No. 13, 17, 18, 19 and 20.	do	5,925.00
	Total		19,934.65
Department of Dakota.			
Fort Assinniboine	Addition to office building No. 22	Brick	254.02
	Stable and wagon shed	Brick and wood.	5,095.00
	Rebuilding officers' quarters No. 5	Wood	2,012.10
Fort Harrison	Addition to wagon shed	do	567.00
	Oil house	Iron	235.00
	Hose-cart house	Wood	662.00
Fort Keogh	Earth closets for buildings Nos. 3, 5, 9, 12, 16, 45, 17, 19, 20, and 21, and converting 28 open-pit closets into earth closets.	do	3,521.08
Fort Missoula	Gymnasium	do	173.10
	Total		12,519.30
Department of Texas.			
Camp Eagle Pass	Kitchen addition to barrack No 7	Brick	630.96
Fort Ringgold	One double set of officers' quarters	do	9,400.00
Fort Sam Houston	Coal-room addition to mess hall	do	319.26
San Antonio	Addition to signal-service building	Brick	745.00
	Total		11,095.22
Department of California.			
Benicia Barracks	Oil house	Iron	200.00
Presidio of San Francisco	Temporary gun shed	Wood	350.00
	Total		550.00
Department of the Colorado.			
Fort Apache	Chapel and schoolroom	Wood	1,000.00
Fort Bayard	Saddle room for stable No. 27	do	159.87
	Additions to barracks Nos. 14, 15, and 16	Wood and brick.	4,330.67
Fort Douglas	Bath house	Brick	2,549.00
	Remodeling commanding officer's quarters	do	964.68
Fort Grant	Fire department building	Wood	607.72
	Addition to root house		75.00
	Knee board for new riding inclosure		165.75
Fort Logan	Balloon shelter	Wood	2,258.75
	Addition to quartermaster workshops	do	515.50
Fort Wingate	Barrack building	Adobe	14,148.94
	Addition to building No. 13 for use as band quarters.	do	592.00
	Total		27,367.88
Department of the Columbia.			
Boise Barracks	Wagon shed	Wood	146.37
Vancouver Barracks	Second story additions to barracks Nos. 35 and 41.	do	1,049.68
	Fence along line of officers' quarters		441.64
	Total		1,637.69
Depots and independent posts.			
Philadelphia depot	Addition to officers' quarters at Schuylkill Arsenal.	Brick	1,094.25
Willets Point	Additions to buildings Nos. 3, 53, and 86	Wood	137.02
	Quartermaster and subsistence storehouse		9,216.00
	Total		9,353.02

Authorizations have also been made from the appropriation for regular supplies, for construction of buildings, etc., as follows:

Post.	Designation.	Material.	Amount authorized.
Fort Adams, R. I	Forage storehouse	Brick	$3,939.00
Fort Apache, Ariz	Hay storehouse	Iron	3,660.80
Fort Brady, Mich	Forage storehouse	Brick	3,489.00
Fort Crook, Nebr	do	do	4,146.00
Fort Douglas, Utah	Hay storehouse	Wood	1,050.00
Fort Ethan Allen, Vt	Extension of forage storehouse	Brick	3,289.00
Fort Hancock, N. J	Bakery and oven	do	4,090.25
Fort Harrison, Mont	Forage storehouse	do	3,950.00
Fort Meade, S. Dak	Hay storehouse	Iron	2,995.00
Fort Niagara, N. Y	Forage storehouse	Brick	3,098.99
Fort Niobrara, Nebr	Hay storehouse	Iron	2,940.00
Presidio of San Francisco, Cal	Bakery and ovens	Brick	4,200.00
	Forage storehouse	Wood	9,939.00
Fort Robinson, Nebr	Hay storehouse	do	2,208.00
Fort Thomas, Ky	Forage storehouse	Brick	1,249.00
Fort Wayne, Mich	do	do	2,690.00
Willets Point, N. Y	Bakehouse and ovens	do	3,494.00
	Total		60,428.04

MILITARY POSTS.

In the act making appropriations for sundry civil expenses of the Government for the fiscal year ending June 30, 1897, Congress provided $300,000 "for the construction of buildings at and the enlargement of such military posts as in the judgment of the Secretary of War may be necessary."

This sum has been apportioned as follows:

Post.	Character of work.		Allotment.
Presidio of San Francisco, Cal	2 double barracks		$77,959.25
Jefferson Barracks	1 double barrack	$19,396.00	
	Printing and advertising	76.61	
			19,472.61
Plattsburg Barracks	4 company barracks	42,904.05	
	Printing and advertising	73.06	
			42,977.11
Fort Harrison	1 double barrack	32,924.00	
	1 double set officers' quarters	11,815.00	
		44,739.00	
	Less amount charged to special appropriation	40,000.00	
			4,739.00
Fort Hancock	Part cost of buildings enumerated under head of barracks and quarters.		80,000.00
Fort Ethan Allan	1 double set officers' quarters	$13,300.00	
	Band barrack	5,450.00	
	Printing and advertising	198.80	
			18,948.80
Fort Myer	Commanding officer's quarters	11,560.10	
	Converting old barrack No. 40 into quarters for 11 bachelor officers	7,905.00	
	Extra work on buildings, printing and advertising	129.88	
			19,594.98
Fort Wayne	1 double set officers' quarters	9,769.69	
	1 double set noncommissioned staff officers' quarters	3,102.00	
	Extra work on buildings, printing and advertising	599.60	
			13,471.29
Fort Hamilton	Quartermaster's stable	6,870.00	
	Printing	14.00	
			6,884.00
Fort Bliss	Subsistence storehouse		8,143.00
Fort Porter	3 double sets officers' quarters	16,500.00	
	1 double set noncommissioned staff officers' quarters	2,995.00	
		19,495.00	
	Less amount charged to barracks and quarters appropriation	11,995.00	
			7,500.00
	Balance June 30, 1897		309.96
	Total		300,000.00

The character and cost of the buildings authorized during the year at the different military posts, and chargeable to the amount indicated in the preceding table, are as stated below.

The expense of plumbing, heating, and gas piping in the buildings, unless otherwise shown, is chargeable to other appropriations of the Quartermaster's Department.

JEFFERSON BARRACKS, MO.

There has been built at this post during the year—

One double barrack (brick), No. 26	$19,396.00
Plumbing in same	1,976.00
Heating in same	2,990.00
Gas piping in same	180.00
Lockers in same	504.00
Total	25,046.00

PLATTSBURG BARRACKS, N. Y.

At this post there is being erected—

A four-company barrack (brick), Nos. 9 to 12	$45,016.05
Plumbing in same	5,009.37
Heating in same	8,852.75
Gas piping in same	300.00
Lockers in same	1,260.00
Total	60,438.17

FORT ETHAN ALLEN, VT.

At the above-named post the following are being erected under contract:

One double set officers' quarters (brick), No. 5	$13,300.00
Plumbing in same	1,165.00
Heating in same	1,120.00
Gas piping in same	65.00
Total	15,650.00
One band barrack (brick), No. 48	5,450.00
Plumbing in same	590.00
Heating in same	685.00
Gas piping in same	25.00
Total	6,750.00

FORT MYER, VA.

This post is being improved by the erection of—

One commanding officer's quarters (brick), No. 1	$11,560.10
Plumbing in same	1,072.00
Heating in same	1,373.00
Gas piping in same	308.00
Total	14,313.10
Converting old barrack No. 40 into quarters for 11 bachelor officers (wood)	7,905.00
Plumbing in same	1,942.00
Heating in same	1,680.00
Total	11,527.00

FORT HAMILTON, NEW YORK HARBOR.

At the above station there is being constructed—

One quartermaster stable (brick)	$6,870.00
Plumbing in same	384.00
Total	7,254,00

FORT BLISS, TEX.

At this post there has been authorized and contracted for—

One subsistence storehouse (brick), No. 49	$8,143.00

FORT PORTER,. N Y.

There is being built at the above-named post—

Three double sets officers' quarters (brick), Nos. 27, 28, and 29	$16,500.00
Plumbing in same	2,100.00
Heating in same	2,029.20
Gas piping in same	117.00
Total	20,746.20
One double set noncommissioned officers' quarters (brick), No. 30	2,995.00
Plumbing in same	321.00
Heating in same	75.00
Gas piping in same	33.00
Total	3,424.00

Seven thousand five hundred dollars only of the cost of these buildings is payable from the appropriation for military posts, and the remainder from other appropriations of this Department.

FORT WAYNE, MICH.

There are now under construction—

ne double set officers' quarters (brick)	$9,892.29
Plumbing in same	1,071.10
Heating in same	971.00
Gas piping in same	60.00
Total	11,994.39
One double set noncommissioned staff officers' quarters (brick)	3,503.50
Plumbing in same	451.00
Heating in same	85.00
Gas piping in same	24.00
Total	4,063.50

In addition to the above, there has been expended for improvement of this military reservation, by the grading and filling in the river front, $20,000, which sum was appropriated for that purpose by act approved June 11, 1896.

FORT HARRISON, MONT.

This post is being enlarged by the construction of the following buildings:

One double barrack (brick), No. 28	$32,924.00
Plumbing in same	2,646.00
Heating in same	4,142.00
Gas piping in same	250.00
Lockers in same	476.00
Total	40,438.00

One double set officers' quarters (brick), No 26	$11,815.00
Plumbing in same	1,055.00
Heating in same	1,416.00
Gas piping in same	93.00
Total	14,379.00

The cost of the above structures is being paid from the $40,000 appropriated by the act of Congress of June 11, 1896, and other funds of the Quartermaster's Department, including $4,739 of the appropriation for military posts.

PRESIDIO OF SAN FRANCISCO, CAL.

Further improvements have been made at this post during the year by the erection of the following-named buildings and other work on the reservation:

Two double barracks (brick), Nos. 4 and 5	$77,959.25
Plumbing in same	4,250.00
Gas piping in same	290.00
Lockers in same	1,500.00
Total	83,999.25

TREES AND TREE CULTURE.

During the months of January, February, and March, 1897, there were planted 1,290 pine trees, 20,920 cypress, 20,760 eucalyptus, and 50 acacia. These trees were planted to fill vacant spaces caused by trees that died or that had been destroyed by storms, etc.

INCLOSING FENCES.

Portion of fence along southern boundary of the reservation and wooden fence west of Central avenue gateway were removed to admit of construction of inclosing wall, and necessary repairs were made to fences inclosing trees, etc.

ROADWAYS.

Construction of roadway to connect McDowell avenue with the road in the ravine to the southwest of the San Francisco National Cemetery, under contract with McCoy & O'Neil, continued during the first six months of the fiscal year; the contractors being without means to properly carry on the work, and the contract having expired, the roadway was completed by the depot quartermaster under the failure clause of the contract.

BRIDGES.

To preserve the bridge which crosses the arm of Mountain Lake it was thoroughly lime washed.

GATEWAYS AND WALLS.

The iron gates at First avenue and Lombard street entrances were cleaned, scraped, and the old paint removed, and newly painted.

Construction of stone wing walls to new gateways at Lombard street and First avenue entrances were completed.

Inclosing wall along boundaries of the reservation, under contract with George M. Perine, was completed and accepted.

Construction of inclosing wall under contract with A. E. Buckman has progressed slowly owing to the contractor being unable to obtain rock in sufficient quantities of the required color to keep his masons at

work. On account of the great depression in the ground it was found necessary to lay additional concrete footings. The amount available for building of the wall is $7,081.44, or about 80 per cent of the number of feet of wall contracted for; if this amount will not build the 80 per cent, the contractor is willing to waive his rights to build the full number of feet on account of the additional footings put in. To date 750 feet of wall has been built, and 1,010 cubic feet of additional concrete foundation has been put in.

The following is a statement of expenditures during the year from the special appropriations made for the above purposes, and their condition on June 30, 1897, viz:

From appropriation of $10,000, act of Congress approved March 2, 1895, fiscal year 1895–96:	
Final payment to D. McPhee, for wing walls	$925.74
Hire of team and driver, in connection with tree culture	4.00
Expenditures previously reported	9,070.26
Total	10,000.00
From appropriation of $10,000, act of Congress approved March 3, 1893, no fiscal year:	
First and second partial payments made to James McCoy and James O'Neil, contractors for roadway	851.75
Final payment to George M. Perine, contractor for stone wall	7,461.65
Services of civil engineer, superintending construction of stone wall and roadway, making detailed drawings, etc	125.00
Hire of teams, foreman, mechanics, laborers, and purchase of necessary tools for construction of roadway under contract of James McCoy and James O'Neil, and charged against them under the failure clause of their contract	1,153.29
On hand to pay final voucher to James McCoy and James O'Neil, awaiting decision of Comptroller of Treasury	307.46
On hand not required	5.76
Expenditures previously reported	95.09
Total	10,000.00
From appropriation of $10,000, act of Congress approved June 11, 1896, fiscal year 1896–97:	
Services of civil engineer in charge of construction of wing walls, inclosing walls, and roadway, making detailed drawings, etc	707.50
Services of inspector of inclosing walls	572.50
Services of inspector of roadway	262.50
Services of rodman making survey of south line of Presidio Reservation	4.38
Hire of labor for cultivation of young trees, and repairing fences inclosing trees, etc	386.76
Planting trees	803.02
Cleaning and painting iron gates	128.00
Cleaning gutters of roadways	12.25
Advertising	38.40
Purchase of whitewash brushes	3.25
Balance on hand to pay for inclosing wall	7,081.44
Total	10,000.00

FORT HANCOCK, N. J.

The construction of a military post at Sandy Hook having been authorized by the Secretary of War, the following buildings have been contracted for and are now in process of erection, together with the water supply and sewer systems:

Four single barracks (brick)	$67,900.00
One administration building (brick)	9,675.00
One guardhouse (brick)	8,295.00

One quartermaster and subsistence storehouse (brick)	$10,175.00
One coal shed (wood)	3,375.00
One workshop (brick)	3,745.00
One bakehouse (brick)	4,090.25
One stable (brick)	8,175.00
One wagon shed (wood)	2,425.00
Two double sets noncommissioned staff officers' quarters (brick)	8,790.00
One commanding officers' quarters (brick)	7,725.00
Six captains' quarters (brick)	74,370.00
Eleven lieutenants' quarters (brick)	78,375.00
Plumbing in 28 of the above buildings	14,243.70
Heating apparatus in 24 of these buildings	22,066.00
Gas piping in 26 of these buildings	1,327.55
Total	324,752.50

Eighty thousand dollars of the appropriation for military posts is made chargeable to the cost of this work, the balance being taken from other funds of the Quartermaster's Department.

MILITARY POST AT SPOKANE, WASH.

For beginning the construction of permanent buildings, providing sewerage, water supply, and other necessary improvements at the above-named place, Congress by act of June 11, 1896, provided $100,000.

This money is being expended in the construction of—

Four double sets officers' quarters (brick), Nos. 11, 13, 15, and 17	$44,387.56
Plumbing in same	3,928.08
Heating in same	4,713.72
Gas piping in same	369.24
One double barrack (brick), No. 25	31,424.82
Plumbing in same	2,455.07
Heating in same	3,633.50
Gas piping in same	245.51
Two double sets noncommissioned staff officers' quarters (brick), Nos. 37 and 38	5,450.58
Plumbing in same	792.82
Gas piping in same	99.10
Total	97,500.00

FORT RILEY, KANS.

To continue construction of buildings at this post there was appropriated by act of June 11, 1896, $75,000, with which the following buildings have been contracted for and are being erected:

One artillery barrack and outhouse (stone), No. 92	$20,480.00
Plumbing in same	1,800.00
Heating in same	2,300.00
Total	24,580.00
Two double sets artillery officers' quarters (stone), Nos. 105 and 106	18,172.00
Plumbing in same	2,789.00
Heating in same	1,775.00
Gas piping in same	115.00
Total	22,851.00
One quartermaster stable (stone)	8,109.00
Five cavalry stable guard buildings (stone), Nos. 45, 59, 61, 63, and 65	4,975.00
One wagon and two ambulance sheds and stone wall	2,875.00
Total	15,959.00

Quartermaster shops and quarters (stone)	$7,100.00
Plumbing in same	670.00
Total	7,770.00
One office and stable guard building (stone)	881.00
Wall around quartermaster corral (stone)	501.60
One chapel and school building (stone)	11,500.00
Heating in same	600.00
Total	12,100.00

FORT D. A. RUSSELL, WYO.

To extend the barracks at this post, Congress appropriated, by act of June 11, 1896, $40,000, with which and other funds of this Department there has been built—

Seventeen brick additions to barracks, Nos. 35, 36, 37, 39, 40, 41, 42, 43, and 44	$50,428.00
Plumbing in same	7,649.87
Lockers in same	1,595.00
Total	59,672.87

FORT MONROE.

By act of June 11, 1896, the sum of $15,000 was provided to erect upon the Government reservation of this post, to cover quarters for the postmaster and office accommodations for customs officer and United States commissioner, a post-office building, which is now being built under contract, after plans and specifications prepared in this office, at the following cost:

For construction	$11,940.00
Plumbing in same	570.00
For heating apparatus	1,022.00
For electric wiring	393.01
Total	13,925.01

MILITARY POST AT BISMARCK, N. DAK.

By the act of June 11, 1896, $40,000 was appropriated for beginning the construction of permanent buildings for a military post at Bismarck, which the Secretary of War was authorized to establish by the act of March 2, 1895, provided that a sufficient quantity of land, not less than 640 acres, suitable for the purpose should be donated free of cost to the United States.

As none of the sites offered by the citizens of Bismarck and vicinity were suitable for the establishing of a military post thereon, no steps have been taken for the erection of buildings at that place, and no portion of the funds provided for that special object has been expended.

Expenditures authorized for water supply, sewerage, plumbing, and drainage; also for roads, walks, grading, bridges, wharves, etc., chargeable to the appropriation for army transportation.

Post.	Water supply, sewerage, plumbing, and drainage.	Roads, walks, grading, bridges, etc.	Wharves.	Miscellaneous.
Fort Adams	$2,879.37	$110.95	$25.00	$64.00
Alcatraz Island	1,635.74	237.50	338.80	.....
Angel Island	1,020.03	550.00	5.28	2,380.00
Fort Apache	6,807.83	.....	.....	8.45
Arlington, Va	.....	10,203.22	.....	.....
Fort Assiniboine	2,176.06	.....	.....	.....
Fort Barrancas	364.56	500.00	.....	827.12
Fort Bayard	1,333.57	.....	.....	12.00
Bazile Creek, Nebr	.....	450.00	.....	.....
Benicia Barracks	804.88	35.00	.....	.....
Bismarck, N. Dak	1.05	.....	.....	.....
Fort Bliss	424.27	55.00	.....	242.01
Boise Barracks	251.86	31.00	.....	.....
Fort Brady	605.48	102.10	.....	4.80
Fort Brown	624.70	352.75	.....	2,994.12
Fort Canby	570.47	.....	.....	.....
Fort Clark	721.16	.....	.....	.....
Fort Clinch	110.00	.....	.....	125.00
Columbus Barracks	1,967.25	553.70	.....	.....
Fort Columbus	.....	3,071.73	.....	.....
Fort Crook	182.45	904.50	.....	64.65
Fort Custer	506.21	20.00	.....	265.00
Fort D. A. Russell	8,175.69	500.00	.....	436.00
Fort Delaware	2,325.00	1,045.00	.....	.....
Denver, Colo	15.75	.....	.....	.....
Fort Douglas	7,724.17	.....	.....	.....
Fort Duchesne	221.80	.....	.....	39.15
Camp Eagle Pass	515.49	60.00	.....	16.50
Fort Ethan Allen	2,848.41	3,694.85	.....	516.00
Finns Point, N. J	199.83	31.00	.....	.....
Governors Island	1,315.27	1,518.75	.....	.....
Fort Grant	1,109.14	.....	.....	6.20
Fort Hamilton	2,214.43	.....	.....	243.70
Fort Hancock	49,841.23	19,950.06	1,389.00	8,187.00
Fort Harrison	4,837.83	178.00	.....	.....
Hot Springs Army and Navy Hospital	13.60	174.65	.....	.....
Fort Huachuca	563.18	300.41	.....	.....
Jackson Barracks	1,395.26	730.60	.....	.....
Jefferson Barracks	17,076.01	1,417.37	.....	1,853.77
Jeffersonville Depot	170.00	1,162.00	.....	.....
Fort Keogh	292.40	.....	.....	.....
Key West Barracks	1,902.41	49.00	222.21	173.50
Fort Leavenworth	1,721.09	288.80	.....	313.69
Fort Logan H. Roots	864.65	2,621.12	.....	498.04
Fort Logan	848.33	122.65	.....	.....
Louisville, Ky	54.75	.....	.....	.....
Madison Barracks	5,318.67	57.50	.....	333.39
Fort Macon	74.50	.....	.....	.....
Fort Mason	651.62	.....	533.65	.....
Fort McHenry	882.33	185.50	.....	44.40
Fort McIntosh	366.21	.....	.....	.....
Fort McPherson	488.74	227.50	.....	.....
Fort Meade	829.39	411.75	.....	.....
Fort Missoula	155.55	4.55	.....	7.20
Fort Monroe	876.06	1,403.15	.....	250.00
Fort Myer	5,804.64	5,768.93	.....	1,715.89
New York City, N. Y	108.00	.....	.....	.....
Fort Niagara	8,055.08	738.00	.....	9.35
Fort Niobrara	849.73	124.07	.....	.....
Niobrara River, Nebr	.....	254.15	.....	.....
Fort Omaha	210.00	.....	.....	.....
Fort Ontario	57.92	.....	.....	.....
Philadelphia Depot	630.25	7.00	.....	441.65
Fort Pickens, Fla	32.25	.....	.....	.....
Plattsburg Barracks	8,651.06	5,403.63	.....	30.00
Fort Popham, Me	25.00	.....	.....	.....
Fort Porter	792.58	219.40	.....	.....
Fort Preble	150.48	115.50	.....	1,951.04
Presidio of San Francisco	10,543.32	973.00	.....	515.00
Fort Reno	559.43	316.00	.....	3.25
Fort Riley	6,822.48	1,476.06	.....	2.27
Fort Ringgold	2,627.67	35.00	.....	210.00
Fort Robinson	2,572.37	108.50	.....	.....
St. Francis Barracks	495.98	162.50	.....	.....
St. Louis, Mo	54.05	120.00	.....	128.00
Fort Sam Houston	288.20	331.50	.....	122.00
San Antonio	1,925.00	14.00	.....	.....

Expenditures authorized for water supply, etc.—Continued.

Post.	Water supply, sewerage, plumbing, and drainage.	Roads, walks, grading, bridges, etc.	Wharves.	Miscellaneous.
San Carlos	$57.69			
San Diego Barracks	547.15			
San Francisco, Cal				$68.00
Sandy Hook, N. J		$9,168.00		90.00
Fort Schuyler	181.03	6,444.80	$25.00	35.40
Fort Sheridan	1,634.47	2.60		2,249.09
Fort Sherman	280.01	3.65		184.50
Fort Sill	8,264.75			2.50
New post near Spokane, Wash				60.00
Fort Slocum	815.07	279.85	50.25	1,035.00
Fort Snelling	1,616.24	12.00		10.00
Fort Spokane	352.72			
Fort Thomas	534.06	319.80		
Fort Trumbull	654.53			75.00
Vancouver Barracks	509.60	304.50		409.25
Vancouver depot	787.77			
Fort Wadsworth	1,146.66	18.00		
Fort Walla Walla	625.16	37.50		
Fort Warren	624.44		950.00	
Fort Washakie	282.85			
Washington, D. C				12.50
Washington Barracks	861.31	1,598.95		132.72
Fort Washington, Md	63.00			400.00
Fort Wayne	1,972.49	75.00		10.00
West Point, N. Y	487.18			148.70
Whipple Barracks	151.06			
Willets Point	3,455.56	543.50		
Fort Wingate	2,217.93			1,048.00
Winthrop, Mass	327.74			
Fort Yates	437.67	32.72		
Fort Yellowstone	229.87	95.26		
Miscellaneous	5,612.96			
Total	224,881.39	88,415.03	3,539.19	31,004.80

Grand total, $347,840.41.

Expenditures authorized for lighting, heating, and cooking apparatus, chargeable to the appropriation for regular supplies for 1896–97.

Station.	Amount.	Station.	Amount.
Fort Adams, R. I	$24.07	Fort Monroe, Va	$2,970.15
Fort Assiniboine, Mont	189.88	Fort Myer, Va	3,538.70
Fort Bayard, N. Mex	2.38	Fort Niagara, N. Y	72.50
Benicia Barracks, Cal	137.70	Fort Niobrara, Nebr	739.00
Fort Bliss, Tex	148.68	Omaha Depot, Nebr	56.65
Boston, Mass	50.00	Philadelphia Depot, Pa	85.00
Fort Brady, Mich	64.74	Plattsburg Barracks, N. Y	21,288.53
Fort Canby, Wash	16.00	Fort Preble, Me	42.96
Fort Clark, Tex	100.70	Presidio of San Francisco, Cal	355.00
Columbus Barracks, Ohio	1,356.17	Fort Reno, Okla	2.00
Fort Crook, Nebr	22.40	Fort Riley, Kans	5,121.43
Fort Custer, Mont	159.50	St. Francis Barracks, Fla	35.00
Fort Delaware, Del	154.74	St. Paul, Minn	977.67
Denver, Colo	3.40	Fort Sam Houston, Tex	246.45
Fort Douglas, Utah	457.50	San Antonio, Tex	101.20
Camp Eagle Pass, Tex	20.00	San Francisco Depot, Cal	9.00
Fort Ethan Allen, Vt	1,937.56	Fort Schuyler, N. Y	106.00
Governors Island, New York Harbor	381.00	Fort Sheridan, Ill	2,147.58
Fort Hamilton, N. Y	322.00	Fort Sherman, Idaho	41.50
Fort Hancock, N. J	24,383.55	Fort Sill, Okla	22.00
Fort Harrison, Mont	6,345.25	Fort Slocum, N. Y	118.65
Hot Springs Army and Navy Hospital, Ark	144.80	Fort Snelling, Minn	1,755.75
Jefferson Barracks, Mo	7,434.31	Spokane, Wash. (new post)	7.50
Jeffersonville Depot, Ind	598.32	Fort Thomas, Ky	1,077.26
Fort Keogh, Mont	48.75	Fort Trumbull, Conn	110.00
Fort Leavenworth, Kans	2,282.04	Fort Wadsworth, N. Y	1,855.95
Fort Logan, Colo	114.40	Fort Warren, Mass	80.00
Fort Logan H. Roots, Ark	3.00	Washington Barracks, D. C	855.58
Madison Barracks, N. Y	9,359.76	Fort Wayne, Mich	1,140.00
Fort Mason, Cal	501.00	Willets Point, N. Y	1,740.44
Fort McHenry, Md	57.50	Winthrop, Mass	83.00
Fort McPherson, Ga	22.75	Fort Yates, N. Dak	13.00
Fort Meade, S. Dak	60.00	Total	103,699.30

For shelter, shooting galleries, ranges for small-arms target practice, repairs and expenses incident thereto Congress, in the act making appropriations for the support of the Army, approved March 16, 1896, provided $10,000, which has been apportioned as follows:

Department.	Character of work.	Amount.
Department of the East	Repairs, etc	$729.65
Department of the Missouri	do	5,082.60
Department of the Platte	do	696.37
Department of Dakota	do	74.78
Department of Texas	do	1,133.92
Department of the Colorado	do	969.79
Department of California	do	1,097.25
Department of the Columbia	do	215.64
Total		10,000.00

HOSPITALS.

In the act making appropriations for the support of the Army for the fiscal year ending June 30, 1897, Congress appropriated $75,000 for construction and repairs of hospitals at military posts already established and occupied, including the extra-duty pay of enlisted men employed on the same, and including also all expenditures for construction and repairs required at the Army and Navy Hospital at Hot Springs, Ark., except quarters for the officers. This fund has been disbursed by officers of the Quartermaster's Department on estimates approved by the Surgeon-General of the Army, as follows:

Department and post.	Amount.	Department and post.	Amount.
Department of the East.		*Department of the Platte.*	
Fort Adams	$710.85	Fort Crook	$151.90
Fort Barrancas	285.55	Fort D. A. Russell	700.00
Columbus Barracks	108.82	Fort Niobrara	2,976.75
Fort Delaware	1,188.00	Fort Robinson	800.00
Fort Ethan Allen	12.27	Fort Washakie	499.80
Jackson Barracks	553.00	Total	5,128.45
Key West Barracks	416.44		
Madison Barracks	399.98		
Fort McHenry	3.50		
Fort McPherson	515.00		
Fort Monroe	21,170.58	*Department of Dakota.*	
Fort Myer	671.10		
Fort Niagara	276.92	Fort Assinniboine	156.13
Plattsburg Barracks	246.20	Fort Custer	149.73
Fort Schuyler	10.88	Fort Harrison	252.85
St. Francis Barracks	3.00	Fort Keogh	300.00
Fort Slocum	150.00	Fort Missoula	399.86
Fort Thomas	2.25	Fort Snelling	981.36
Fort Wadsworth	16,297.10	Fort Yates	156.92
Fort Warren	20.94	Fort Yellowstone	387.81
Washington Barracks	1,224.61	Total	2,784.66
Total	44,266.99		
Department of the Missouri.		*Department of Texas.*	
Fort Brady	239.89		
Jefferson Barracks	4,626.71	Fort Bliss	263.10
Port Leavenworth	3,936.00	Fort Brown	436.05
Fort Logan H. Roots	75.15	Fort Clark	200.00
Fort Riley	285.77	Camp Eagle Pass	308.95
Fort Sheridan	87.96	Fort McIntosh	707.00
Fort Sill	268.45	Fort Ringgold	135.11
Fort Wayne	140.60	Fort Sam Houston	299.90
Total	9,660.53	Total	2,350.11

Department and post.	Amount.	Department and post.	Amount.
Department of California.		*Department of the Columbia.*	
Alcatraz Island	$62.48	Boise Barracks	$15.38
Angel Island	417.29	Fort Canby	178.84
Fort Mason	123.75	Fort Spokane	49.93
Presidio of San Francisco	3,423.55	Vancouver Barracks	647.92
		Fort Walla Walla	139.07
Total	4,027.07	Total	1,031.14
Department of the Colorado.		*Independent posts.*	
Fort Apache	156.71		
Fort Douglas	2,151.36	Hot Springs Army and Navy Hospital	840.00
Fort Grant	699.25	Willets Point	163.22
Fort Huachuca	299.00		
Fort Logan	885.22	Total	1,003.22
San Carlos	150.00		
Whipple Barracks	259.11	Balance June 30, 1897	147.18
Total	4,600.65	Grand total	75,000.00

The above statement includes a new hospital under construction at Fort Monroe, Va., at a cost of $17,954.38; a new hospital under construction at Fort Wadsworth, N. Y., at a cost of $16,240; and a building for dormitory, etc., at Fort Leavenworth, Kans., which has been completed at a cost of $2,906.

HOSPITAL STEWARDS' QUARTERS.

In the army appropriation act for the fiscal year ending June 30, 1897, Congress also appropriated $7,000 for construction of quarters for hospital stewards at military posts already established and occupied, including the extra duty pay of enlisted men employed on same. This sum has been apportioned to the posts named below:

Post.	Amount.	Post.	Amount.
Fort Adams	$48.00	Fort Monroe	$37.18
Fort Apache	16.66	Fort Myer	3,824.50
Fort Brady	20.50	Fort Niobrara	68.48
Fort Brown	69.78	Fort Porter	28.23
Columbus Barracks	19.40	Presidio of San Francisco	130.00
Fort Custer	69.62	Fort Riley	161.27
Fort Grant	68.08	Fort Robinson	72.00
Fort Harrison	504.63	Fort Schuyler	31.97
Jackson Barracks	120.00	Fort Slocum	56.00
Jefferson Barracks	121.60	Fort Sill	49.20
Fort Keogh	74.63	Fort Snelling	215.10
Fort Logan	10.95	Fort Spokane	8.00
Fort Logan H. Roots	23.00	Washington Barracks	182.40
Madison Barracks	225.00	Fort Wayne	63.00
Fort Mason	38.00	Willets Point	44.60
Fort McHenry	6.00	Balance June 30, 1897	73.86
Fort McPherson	102.00		
Fort Meade	259.90	Total	7,000.00
Fort Missoula	156.46		

Included in the above is a set of steward's quarters at Fort Myer, Va., completed at cost of $3,086.66.

DAMAGES BY STORMS.

On July 7, 1896, the wharf and boathouse at Fort Barrancas, Fla., were swept away by a storm. The cost of rebuilding same was estimated at $2,100. At the same time buildings at the post were damaged to the extent of about $193. The iron flagstaff was also wrecked, for the repair of which $350 has been allotted.

On May 18, 1897, Fort Bayard, N. Mex., was struck by a violent windstorm. Sixty-three feet of roof was blown off the quartermaster's storeroom (building No. 22) and completely demolished, and 100 feet of the corral (No. 26) and 100 feet of fence were blown down.

Losses by fire.

Post.	Building.	Damages.
Fort Wingate, N. Mex.	Barracks for 8 companies (Nos. 24 to 27 and 29 to 32).	Destroyed.
	Coal sheds for same (Nos. 24 to 27 B and 29 to 32 B).	Do.
	Bath and wash houses (Nos. 14, 15, 16, and 17).	Do.
	1 double and 2 single sets officers' quarters (Nos. 10, 11, and 12).	Do.
	Administration building (No. 18)	Do.
	Post chapel (No. 19)	Do.
	Ordnance storehouse (No. 28)	Do.
Fort Du Chesne, Utah	Engine house	Do.
Fort Apache, Ariz	Cavalry stable (No. 3 C)	About $250 damaged.
Fort Assinniboine, Mont	1 double set officers' quarters (No. 5)	About $2,000 damaged.
Fort Niobrara, Nebr	Gymnasium (No. 22)	Slightly damaged.
Washington Barracks, D. C.	Officers' quarters (No. 22, building No. 15).	Do.
Fort Ringgold, Tex	1 double set officers' quarters (Nos. 6 and 7).	Destroyed.
Fort Keogh, Mont	Hospital (No. 23)	Slightly damaged.
	Noncommissioned staff officers' quarters (No. 55).	Do.
	Noncommissioned staff officers' quarters (No. 22).	Do.
Fort Sam Houston, Tex	Officers' quarters (No. 35)	About $290 damage.
Fort Custer, Mont	Post exchange (No. 20)	Destroyed.
	Teamsters' mess, etc. (No. 24)	Destroyed; building worthless.
Fort Missoula, Mont	Barracks (No. 21)	Slightly damaged.
Jefferson Barracks, Mo	Offices and quarters for enlisted men (No. A).	Destroyed.
	Teamsters' mess (No. O)	Upper portion destroyed
Fort Bayard, N. Mex	Bakery (No. 31)	Slightly damaged.
Fort Spokane, Wash	One double set officers' quarters (Nos. 9 and 10).	Destroyed.
Fort Huachuca, Ariz	Cavalry stable (No. 33)	Do.

Statement of property rented by the Quartermaster's Department for use as offices, barracks, quarters, encampments, etc., during the fiscal year, and the amount of rent paid therefor.

DEPARTMENT OF THE EAST.

Post or station.	Kind of property.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Boston, Mass	8 rooms	Offices and storerooms, quartermaster and subsistence departments.	$90.00	$1,080.00
Baltimore, Md	2 rooms	Offices quartermaster's department	47.92	143.75
New Orleans, La	Building	Offices and storerooms, quartermaster and subsistence departments.	83.33	999.96
Atlanta, Ga	2 rooms	Office paymaster	25.00	300.00
	do	Office qartermaster	25.00	275.00
Winston, Ga	Ground	Camp for battalion Fifth Infantry en route Waco, Ga., to Fort McPherson, Ga.		5.00
Washington, D. C.	1 room	Quarters for veterinary surgeon, Fort Myer, Va.	12.00	144.00
Plattsburg, N. Y.	do	Stable	7.00	84.00
Newport, Ky		Stable accommodations for public animals.	10.00	16.00
Fort Myer Heights, Va.	1 room	Hospital steward's quarters	12.00	18.00
Kendall, Parma, Hilton, Carlyon, Wilson, and Somerset, N. Y.	Grounds	Camp for Thirteenth Infantry on practice march.		37.80
Fernandina, Fla	5 rooms	Quarters' ordnance sergeant at Fort Clinch, Fla.	10.00	68.00
St. Augustine, Fla	12 rooms	Quarters for N. C. S. officers	20.00	50.00
Charlotte, Addison, Middlebury, Vt., and Fort Ann, N. Y.	Grounds	Camp for Third Cavalry, Fort Ethan Allen, Vt., while on practice march.		30.00
New York	Grounds	Camp for Light Battery K, First Artillery, while on practice march Fort Hamilton to Catskill Mountains.		77.00
Cape Cod Peninsula, Mass.	do	Camp for Light Battery, Fourth Artillery, while on practice march.		19.50

Statement of property rented by the Quartermaster's Department, etc.—Continued.

DEPARTMENT OF THE EAST—Continued.

Post or station.	Kind of property.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Kentucky	Grounds	Camp for Sixth Infantry while on practice march Fort Thomas to Licking River.		$75.00
Burlington, Vt.	1 room	Office constructing quartermaster, Fort Ethan Allen, Vt.	$14.58	175.00
	Building	Stable for public animals	12.00	144.00
Total				3,742.01

DEPARTMENT OF THE MISSOURI.

Chicago, Ill.	28 rooms	Offices, headquarters department	$1,000.00	$12,000.00
	Building	Offices, subsistence department, and storehouses for quartermaster and subsistence department.	416.66	4,999.92
	do	Stables for animals of the quartermaster's department.	150.00	1,800.00
	1 room	Quarters for hospital steward	12.00	144.00
	do	Quarters for signal sergeant	12.00	144.00
	2 rooms	Office of quartermaster purchasing cavalry and artillery horses.	30.00	325.00
	1 room	Storeroom quartermaster purchasing cavalry and artillery horses.	15.00	90.00
Kansas City, Mo.	2 rooms	Office, subsistence department	60.00	720.00
	1 room	Quarters commissary sergeant	10.00	120.00
Rush Springs, Ind. T.		Shelter for teamsters	25.00	300.00
Detroit, Mich.	Building	Office and drafting, constructing quartermaster, Fort Wayne, Mich.	25.00	300.00
Easton, Osawkie, Winchester, Silver Lake, St. Mary's, Manhattan, and Wamego, Kans.	Grounds	Camp for troops on practice march from Fort Leavenworth.		162.00
Clarenceville, New Hudson, Brighton, Fleming, Williamston, Lansing, Novi, and Sand Hills, Mich.		Camp for troops changing stations from Fort Brady to Fort Wayne.		87.85
Six Mile House, Farmington, New Hudson, Mich.	Grounds	Camp for troops from Fort Wayne, Mich., on march to and from encampments with the militia of the State of Michigan.		26.00
McHenry, Ill	do	Camp for troops from Fort Sheridan, Ill., on practice march.		10.00
Connors Creek, Mich	do	Camp for troops from Fort Wayne, Mich., on practice march.		80.00
Goldman, Mo	do	Camp for troops from Jefferson Barracks, Mo. Target practice.		4.00
Little Rock, Ark.	3 rooms	Office, constructing quartermaster new post.	30.00	136.00
	Building	Stable for public animals	5.00	22.67
Total				21,421.44

DEPARTMENT OF THE PLATTE.

Omaha, Nebr.	41 rooms	Offices, department headquarters	$666.67	$8,000.04
	1 room	Quarters for commissary sergeant	12.00	144.00
Ogden, Utah	2 rooms	Office and storeroom for quartermaster's agent.	25.00	300.00
Total				8,444.04

DEPARTMENT OF DAKOTA.

St. Paul, Minn.	1 room	Quarters for signal sergeant	$12.00	$144.00
Camp Lakeview, Minn.	Grounds	Camp for troops from Fort Snelling on practice march.		113.00
Missoula, Mont.	do	Camp for troops from Fort Missoula on practice march.		3.00
Helena, Mont.	5 rooms	Offices, quartermaster's department	50.00	600.00
	1 room	Storeroom, quartermaster's department	10.00	120.00
	do	Stable, quartermaster's department	10.00	120.00
Bismarck, N. Dak.	4 rooms	Office, constructing quartermaster	20.00	180.00
Total				1,280.00

Statement of property rented by the Quartermaster's Department, etc.—Continued.

DEPARTMENT OF TEXAS.

Post or station.	Kind of property.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
Hebronville, Tex	1 room	Office for quartermaster's agent	$8.00	$96.00
Santa Maria, Tex	Building and ground.	Quarters and storeroom for a detachment.		150.00
Laredo, Tex	1 room	Quarters for signal sergeant, Fort McIntosh.	12.00	12.00
San Antonio, Tex	do	Quarters for commissary sergeant	12.00	40.00
	do	Quarters for veterinary surgeon, Fort Sam Houston.	12.00	144.00
	do	Quarters for signal sergeant	12.00	24.00
	do	do	12.00	24.00
	do	do	12.00	139.20
	do	do	12.00	129.60
	do	do	12.00	127.20
	do	do	12.00	121.20
	do	do	12.00	144.00
	do	do	12.00	144.00
Total				1,295.20

DEPARTMENT OF CALIFORNIA.

San Francisco, Cal	45 rooms	Offices for department headquarters	$750.00	$9,000.00
	Building	Stable, headquarters department	45.00	540.00
	1 room	Quarters, signal sergeant	12.00	144.00
San Diego Barracks, Cal	Building	Post hospital	70.00	840.00
	66 rooms	Officers' quarters	12.00	1,769.60
Total				12,293.60

DEPARTMENT OF THE COLUMBIA.

Portland, Oreg	7 rooms	Offices, paymasters and depot quartermaster.	$111.00	$1,332.00
Vancouver, Wash	1 room	Quarters for signal sergeant	12.00	132.00
Spokane, Wash	2 rooms	Office, constructing quartermaster	25.00	287.50
	Building	Stable for public animals	10.00	110.00
Seattle, Wash	2 rooms	Office, constructing quartermaster	23.50	258.50
Total				2,120.00

DEPARTMENT OF THE COLORADO.

Albuquerque, M. Mex	1 room	Office for paymaster	$25.00	$300.00
Brock, Utah	do	Quarters for signal sergeant	10.00	63.67
Cedar Springs, Ariz	do	do	12.00	144.00
Cooleys, Ariz	do	do	12.00	144.00
Denver, Colo	46 rooms	Headquarters Department of the Colorado	666.66	7,999.92
	Building	Stable, quartermaster's department	50.00	600.00
	2 rooms	Quarters for signal sergeant	24.00	288.00
Holbrook, Ariz	1 room	Office, quartermaster's agent	5.00	25.00
	do	Quarters, signal sergeant	12.00	144.00
Fort Logan, Colo	2 rooms	Quarters, for signal sergeant	12.00	22.80
Mammoth, Ariz	1 room	do	12.00	144.00
Price, Utah	do	do	12.00	144.00
	Building	Quartermaster's warehouse	15.00	180.00
San Bernardino, Ariz	1 room	Quarters for signal sergeant	12.00	80.00
Silver City, N. Mex	do	do	12.00	144.00
Willcox, Ariz	do	do	12.00	144.00
Total				10,567.39

Statement of property rented by the Quartermaster's Department, etc.—Continued.

GENERAL DEPOTS OF THE QUARTERMASTER'S DEPARTMENT.

Post or station.	Kind of property.	Purpose for which used.	Monthly rate of rent.	Total amount for year.
New York depot	1 room	Quarters for hospital steward	$14.00	$126.46
	Building	Stable and carriage-house for public animals, etc.	112.50	1,350.00
Philadelphia depot	Part of building.	Offices and stables	179.17	2,150.04
	1 room	Office for attending surgeon	18.00	216.00
	do	Quarters for post quartermaster's sergeant.	12.00	87.20
St. Louis depot	Building	Storehouse for medical department	166.67	2,000.00
San Francisco depot	do	Offices and storehouses for medical, subsistence, and quartermaster's departments.	833.33	9,999.00
		Storehouse for quartermaster supplies	125.00	1,500.00
		Storage of oils and turpentine, ¼ cent per case and 10 cents per barrel.		715.05
	1 room	Quarters for commissary sergeant	12.00	144.00
Washington depot	Ground	Stables, storehouses, etc	150.00	1,800.00
	1 room	Quarters for hospital steward	21.00	252.00
	do	do	12.00	144.00
	do	do	12.00	144.00
	do	Quarters for private, hospital corps	12.00	144.00
	do	do	12.00	144.00
	do	Quarters for sergeant Signal Corps	12.00	144.00
	do	do	12.00	144.00
	do	do	12.00	144.00
	do	do	12.00	114.80
	do	do	12.00	16.80
	do	Quarters for ordnance sergeant, Fort Pulaski, Ga.	12.00	12.00
	do	Quarters for post quartermaster's sergeant at Nashville, Tenn.	12.00	36.00
	do	Quarters for sergeant Signal Corps, Nashville, Tenn.	12.00	28.80
	do	Quarters for ordnance sergeant, Nashville, Tenn.	12.00	28.80
	do	Quarters for sergeant, battalion engineers	12.00	28.80
	do	Quarters for private, battallion engineers	12.00	28.80
		Office for military attaché, Paris, France		360.00
		Office for military attaché, Berlin, Germany.		180.00
		Office for military attaché, London, England.		72.00
		Office for military attaché, Rome, Italy		300.00
		Office for military attaché, Vienna, Austria.		160.00
		Office for military attaché, Madrid, Spain		152.52
		Office for military attaché, Brussels, Belgium.		180.00
Total				23,047.07

RECAPITULATION.

Departments, etc.	Amount.
Department of the East	$3,742.01
Department of the Missouri	21,421.44
Department of the Platte	8,444.04
Department of Dakota	1,280.00
Department of Texas	1,295.20
Department of California	12,293.60
Department of the Columbia	2,120.00
Department of the Colorado	10,567.39
New York depot	1,476.46
Philadelphia depot	2,453.24
Washington depot	4,759.32
St. Louis depot	2,000.00
San Francisco depot	12,358.05
Total	84,210.75

Statement showing property rented by the Quartermaster's Department during the fiscal year ending June 30, 1897, for use as recruiting stations, etc., and amount paid for lodgings.

Place where rented.	Number of rooms.	Purpose for which used.	Monthly rate of rent.	Total amount for the year.
Richmond, Va	2 floors	Recruiting station	$50.00	$600.00
Lynchburg, Va	5 rooms	do	34.50	165.25
Baltimore, Md	Building	do	40.00	480.00
San Francisco, Cal	6 rooms	do	70.00	770.00
St. Louis, Mo	3 rooms	Lodgings	37.00	444.00
Philadelphia, Pa	9 rooms	Recruiting station	72.50	850.00
Pittsburg, Pa	Building	do	75.00	900.00
Harrisburg, Pa	6 rooms	do	47.00	564.00
New York City	14 rooms	do	130.00	1,560.00
Albany, N. Y	6 rooms	do	40.00	480.00
Buffalo, N. Y	Building	do	45.00	495.00
Jersey City, N. J	2 rooms	do	35.00	373.34
		Lodgings		175.50
Syracuse N. Y	do	Recruiting station	20.00	90.00
		Lodgings		55.25
St. Paul, Minn	6 rooms	Recruiting station	66.33	331.65
	Do	do	56.33	56.33
	Do	do	43.00	258.00
		Lodgings		11.00
Portland, Oreg		do		226.00
	5 rooms	Recruiting station	43.00	516.00
Seattle, Wash	3 rooms	do	25.00	300.00
	House	Domitory	29.00	
			27.50	331.50
Chicago, Ill	8 rooms	Recruiting station	82.00	984.00
Cincinnati, Ohio	15 rooms	do	72.00	864.00
Cleveland, Ohio	3 rooms	do	63.37	760.44
Detroit, Mich	6 rooms	do	63.00	693.00
Evansville, Ind	8 rooms	do	50.41	604.92
Indianapolis, Ind	do	do	50.00	600.00
Louisville, Ky	5 rooms	do	57.00	684.00
Milwaukee, Wis	6 rooms	do	56.00	672.00
Nashville, Tenn	9 rooms	do	50.00	600.00
Des Moines, Iowa	2 rooms	do	55.00	179.67
Springfield, Ill	do	do	23.00	76.66
	1 room	Lodgings	16.00	53.33
Wheeling, W. Va	2 rooms	Recruiting station	19.33	96.65
Grand Rapids, Mich	2 rooms	do	17.00	51.00
Parkersburg, W Va		Lodgings		145.66
Ottumwa, Iowa		do		3.25
Dallas, Tex	3 rooms	Recruiting station	34.00	408.00
		Lodgings		112.75
Cumberland, Md	3 rooms	Recruiting station	29.00	87.00
		Lodgings		14.75
Boston, Mass	3 floors	Recruiting station	60.00	720.00
Providence, R. I	2 rooms	do	*a* 1.00	335.00
		Lodgings		232.00
Total				19,010.90

a Per day.

RESERVATIONS.

Under terms of act approved July 8, 1886 (G. O. 52 of 1886), the grounds comprising Old Fort Brady, Mich., authorized to be sold were duly platted, appraised, etc., and under public advertisement the buildings and fencing were disposed of at auction in October, 1893, for the sum of $2,072.50.

Forty-two lots have thus far under the act been sold at public and private sale (at not less than appraised value), total amount realized being $36,400, which sum (less cost attending sales) has been deposited in the Treasury.

The remaining 22 unsold lots are in charge of the quartermaster, Fort Brady, Mich., to whom application for purchase is made.

Under act approved March 1, 1890, the military reservation of Old

Fort Bliss was platted, appraised, and advertised for sale at public auction July 3, 1895.

At that sale lots Nos. 5, 6, 21, 22, 24, and 25 were disposed of, amount realized being	$2,570.00
Lots 4 and 12 were sold May 7, 1896, at private sale at appraised valuation.	2,380.00
Total thus far realized	4,950.00

Which sum, less expenses attending sales, has been deposited in the Treasury.

March 9, 1897, Secretary of War executed an agreement giving James R. Harper, county judge, as agent for and on behalf of the county of El Paso, Tex., option, etc., to purchase within one year from date, at appraised value of $2,920, lot 18, with appurtenances thereon.

If not so purchased within the year, then the county is to pay an annual rental of $150 to the quartermaster at the new post and deliver up the property in as good condition as at time of execution of agreement.

Remaining lots are in charge of the quartermaster at new Fort Bliss for disposal.

The act of August 9, 1894, provides that when this reservation shall have been sold, "so much of the receipts therefrom as may be necessary, not to exceed four thousand dollars, are hereby appropriated to the construction of a military road between the city of El Paso and new Fort Bliss, Texas, said money to be expended under the direction of the Secretary of War."

This road has not as yet been constructed.

Under sundry civil acts approved August 18, 1894, and June 11, 1896, an additional 161.8 acres of land have been acquired for Fort Ethan Allen, Vt., at a cost of $10,000, title thereto having been approved by the Department of Justice November 3, 1896, and deeds duly recorded among county records.

In sundry civil act approved March 2, 1895 (General Orders 13, of 1895), the following appears:

> The Secretary of War is hereby authorized, within his discretion, to establish a military post at such point on Puget Sound as shall in his judgment best subserve the public interests, provided that six hundred and forty acres of land suitable for the purpose shall be donated free of cost to the United States, or such greater quantity of land as in the opinion of the Secretary of War shall be necessary for the purpose.

Citizens of Seattle, representing the chamber of commerce, having first tendered a tract of 703 acres on Magnolia Bluff, about 3 miles from Seattle, the site was approved by the Secretary of War March 2, 1896, subject to Department of Justice rendering favorable opinion regarding title, etc.

It having been subsequently shown to the satisfaction of the War Department that insurmountable obstacles prevented the citizens from acquiring the full tract as originally tendered, a slightly reduced area has been made acceptable to the Department, the title papers of which are being collected for action of Department of Justice.

Sundry civil act of March 2, 1895 (General Orders 13, of 1895), authorizes the Secretary of War, within his discretion, to establish a military post at or near the city of Bismarck, N. Dak., provided a sufficient quantity of suitable land, not less than 640 acres, be donated free of cost to the United States, and further, by sundry civil act approved June 11, 1896, $40,000 is appropriated "for beginning the construction of permanent buildings," etc.

No site acceptable to the Department has thus far been tendered and no portion of the $40,000 above referred to has been used, it having been held by the Treasury to be an annual appropriation, good only for use during the fiscal year to which it pertained.

Sundry civil act, approved June 11, 1896, further provides:

For the purchase of land for a target range for the use of troops stationed at Jefferson Barracks, Missouri, eighteen thousand dollars, provided that any land purchased hereunder shall be unincumbered by any private or public ways or roads.

This office possesses no information as to what steps, if any, the War Department has taken with view of securing the range, the $18,000 above referred to being again appropriated in sundry civil act approved June 4, 1897, and "made available for expenditure during the fiscal year eighteen hundred and ninety-eight."

Act approved July 23, 1888 (General Orders, No. 60, of 1888), authorizes the Secretary of War, after purchase of site and construction of new post (now known as Fort Crook, Nebr.), to sell the military reservation known as Fort Omaha.

The new post has been built and occupied, but no definite steps have yet been taken for disposing of the valuable land—some 80 acres which comprise Old Fort Omaha—owing to business depression, etc., of recent years.

General orders, Adjutant-General's Office, affecting military reservations, etc., issued during the year, are as follows:

General Orders, No. 28, of 1896, publishes President's order of July 1, 1896, directing that the military post and fortifications on Davids Island, New York, will hereafter be known and designated as Fort Slocum, in honor of the late Maj. Gen. Henry W. Slocum, United States Volunteers.

General Orders, No. 44, of 1896, announces President's action of September 22, 1896, transferring portion of Fort Robinson (Nebr.) Reservation to Interior Department.

General Orders, No. 48, of 1896, publishes President's action of November 20, 1896, reserving as a military reservation certain lands at Marrowstone Point, Admiralty Inlet, Washington.

General Orders, No. 52, of 1896, publishes President's action of December 18, 1896, transferring to Interior Department certain portion of the military reservation on the Sucia Islands, Gulf of Georgia, Washington.

General Orders, No. 2, of 1897, announces enlargement of limits of the Arlington (Va.) National Cemetery.

General Orders, No. 7, of 1897, publishes President's action of February 25, 1897, reserving for military purposes certain lands in Dade and Monroe counties, Fla.

General Orders, No. 14, of 1897, publishes President's action of February 26, 1897, adding to the Fort Sill (Okla.) Military Reservation certain lands "for exclusive use for military purposes and for the permanent location thereon of the Apache prisoners of war."

General Orders, No. 15, of 1897, publishes act approved March 2, 1897, granting right of way to St. Paul, Minneapolis and Manitoba Railway Company through Fort Spokane Reservation, Wash.

General Orders, No. 21, of 1897, publishes President's action of March 23, 1897, transferring certain portion of the Fort Clinch, Fla., Reservation to the Interior Department.

General Orders, No. 24, of 1897, publishes President's action of April 22, 1897, directing that new post at Little Rock, Ark., be hereafter known and designated as Fort Logan H. Roots, in honor of the late Bvt. Col. Logan H. Roots, United States Volunteers.

General Orders, No. 25, of 1897, publishes President's order of April 29, 1897, directing that the fortification at Lime Point, San Francisco Harbor, hereafter be known and designated as Fort Baker, in honor of the late Col. E. D. Baker, United States Volunteers.

General Orders, No. 28, of 1897, publishes President's action of May 10, 1897, reserving certain lands for defense of St. Andrews Bay, Florida.

Custodians are employed and paid by the Quartermaster's Department in caring for the following reservations:

Old Fort Bliss, Tex., Frank E. Tusten, $60 per month.
Madison Barracks Target Range, New York, James Fleming, $15 per month.
Fort Omaha, Nebr., Jerry Howard and Seth T. Cole, $45 per month each.
At Fort Townsend, Wash., J. W. Brown; at Fort Davis, Tex., J. L. Janes; at Monterey, Cal., Francis Doud, serve without money consideration.

Very respectfully,

C. P. MILLER,
Captain and Assistant Quartermaster, U. S. A.

The QUARTERMASTER-GENERAL, UNITED STATES ARMY,
Washington, D. C.

WAR DEPARTMENT,
QUARTERMASTER-GENERAL'S OFFICE,
Washington, D. C., August —, 1897.

GENERAL: I have the honor to report the operations of the mail and record division for the fiscal year ended June 30, 1897.

MAIL AND RECORD DIVISION.

The following communications were received, and letters and indorsements mailed:

Original cases	9,498
Received back	36,199
Letters and indorsements mailed	41,330

MISCELLANEOUS CLAIMS AND ACCOUNTS.

At the beginning of the fiscal year there were on hand awaiting action:	
14 miscellaneous claims, amounting to	$7,000.50
4 accounts, amounting to	78.17
There were received during the year:	
177 miscellaneous claims, amounting to	31,221.30
232 accounts, amounting to	21,608.60
Total 427 claims and accounts, amounting to	59,908.57

Final action was taken on these as follows:

3 claims were approved for payment of	$170.73
2 claims were referred to other Departments	190.00
76 claims were sent to Treasury Department for settlement	13,142.72
43 claims were rejected	8,226.33
Reduction upon claims approved and referred	2,623.82
198 accounts were approved for payment of	14,830.37
Being a reduction of	44.12
13 accounts were referred to other Departments	1,293.16
11 accounts were rejected, amounting to	192.49
Total upon which final action was taken, 124 claims and 222 accounts, amounting to	40,713.74

There were on hand awaiting action July 1, 1897:

67 claims, amounting to	$13,868.20
14 accounts, amounting to	5,326.63
Total, 81 claims and accounts	19,194.83

CLAIMS UNDER THE ACT OF JULY 4, 1864.

There remained in this office on July 1, 1897, not finally acted upon, 97 claims presented under the act of July 4, 1864, amounting to $120,668.37.

Action upon these claims has been suspended awaiting additional evidence.

The papers pertaining to 19 claims, amounting to $46,877.93, which had previously been investigated and disallowed by the Quartermaster-General, were, during the year, transmitted to the Court of Claims or to the Department of Justice for use as evidence in such cases as had been appealed to the Court of Claims under provisions of the law of March 3, 1883, known as the Bowman Act.

NEWSPAPERS AND PERIODICALS.

During the fiscal year, newspapers and periodicals have been supplied for the enlisted men of the Army at 95 military post libraries at a cost of $3,339.79. These posts were garrisoned by 392 companies or detachments.

PRINTING AND BINDING.

During the fiscal year 355 requisitions were made on the Public Printer for printing and binding. The cost for the work, so far as bills have been received, is $5,588.98, which sum does not include the cost of work done in the War Department branch printing office.

NATIONAL CEMETERIES.

The national cemeteries are classed as follows:

First class	25
Second class	20
Third class	16
Fourth class	22
Total	83

The interments therein to June 30, 1897, are:

Known	185,412
Unknown	150,864
Total	336,276

There are 75 superintendents, the total number authorized. Changes during the year: Appointed, 3; discharged, 2; died, 1. Two assistant superintendents have completed the probationary service required by the rules of the Department and are awaiting appointment when vacancies occur.

Removals of remains of officers, enlisted men, and others from abandoned post cemeteries and elsewhere to other permanent post or national cemeteries were as follows:

From—	To national or other cemetery at—	Number.
Springhill, Maury County, Tenn	Nashville (Tenn.) National Cemetery	2
West Pascagoula, Miss	Chalmette (La.) National Cemetery	1
Near Glendale, Va	Glendale (Va.) National Cemetery	2
Fort Mifflin, Pa	Philadelphia (Pa.) National Cemetery	10
Near Rappahannock River, Virginia	Fredericksburg (Va.) National Cemetery	1
Adams County, Ohio	Cave Hill (Ky.) National Cemetery	1
Forts Steadman and Rice, Va	Poplar Grove (Va.) National Cemetery	2
Fort Jackson, Ala	Mobile (Ala.) National Cemetery	70

From—	To national or other cemetery at—	Number.
Fort Monroe, Va.	Hampton (Va.) National Cemetery	303
Fort McPherson, Ga.	Marietta (Ga.) National Cemetery	33
Potters' field, San Antonio, Tex.	San Antonio (Tex.) National Cemetery	1
Colliersville, Tenn.	Memphis (Tenn.) National Cemetery	2
Near Forest City, Ark.	....do	8
Fort Wayne (post cemetery), Mich.	Woodmere Cemetery, Fort Wayne (Mich.)	161
Columbus Barracks (post cemetery), Ohio.	Green Lawn Cemetery, Columbus (Ohio)	87
Total reinterred		684

Instructions have also been given for removal of the remains of United States soldiers from the abandoned military post of Fort Concho, Tex., to the San Antonio (Tex.) National Cemetery.

There being no national cemetery in the vicinity of the military posts of Fort Wayne, Mich., and Columbus Barracks, Ohio, and the continuance of the post cemeteries being deemed undesirable for sanitary and other reasons, arrangements were made for removal of the remains to, and for the interment of officers and enlisted men who may hereafter die at these posts in, incorporated cemeteries in the vicinity, at a stipulated cost for each interment, to include digging, filling, sodding, and future care of the graves, without further expense to the United States.

Headstones.—To mark the graves of known Union soldiers, sailors, and marines in national, post, city, and village cemeteries, 9,914 white marble headstones were provided.

Indigent soldiers.—Under the acts of Congress (sundry civil) making appropriations for "Expenses of burying in the Arlington National Cemetery, or in the cemeteries of the District of Columbia, indigent ex-Union soldiers, sailors, and marines of the late civil war who die in the District of Columbia," claims for the burial of 69 such persons have been paid, at a total cost of $2,685.

Roadways.—The roadway authorized by Congress June 8, 1896, from the north side of Cache River Bridge, in Pulaski County, Ill., to connect with the graveled road running from Mound City, Ill., to the Illinois Central Railroad in said county, is nearly completed.

Amount appropriated	$15,000.00
Amount expended during the year	10,656.75

Length of road, 4,960 feet.

The draining and repairing of the road to the Hampton (Va.) National Cemetery, authorized by acts of Congress (sundry civil) approved March 2, 1889, and August 30, 1890, still awaits the action of the board of supervisors of Elizabeth City County, Va.

Under the acts of Congress (sundry civil) making appropriations for "Repairing roadways to national cemeteries," repairs have been made to roadways leading to the national cemeteries at Alexandria, Va.; Antietam, Md.; Corinth, Miss.; Culpeper, Va.; Fayetteville, Ark.; Florence, S. C.; Fredericksburg, Va.; Marietta, Ga.; Mound City, Ill.; Natchez, Miss.; Newbern, N. C.; Port Hudson, La.; Richmond, Va.; Springfield, Mo.; Staunton, Va., and Vicksburg, Miss. Amount expended, $8,805.78.

The estimated requirement for maintenance and improvement of these roadways during the fiscal year was $10,545.60, but in consequence of the limited appropriation for the purpose the repairs were confined to such as were absolutely necessary for their protection, deferring improvements until an adequate appropriation therefor should be authorized.

Memorial Day (May 31) was duly observed at the several cemeteries, in most instances by appropriate services conducted by the Grand Army of the Republic and similar patriotic organizations, and at some of the smaller cemeteries by the citizens, school children, and others, under the direction of the superintendents.

Improvements and repairs of national cemeteries.—At the Alexandria (Va.) National Cemetery, repairs were made to the lodge and a new porch constructed.

At the Arlington (Va.) National Cemetery, repairs were made to the inclosing wall, gates, mansion, outbuildings, water supply and drainage, and an iron flagstaff 100 feet in length erected to replace a similar staff 50 feet in length. The granolithic walk from the principal entrance on the eastern side of the cemetery to the mansion, contracted for during the previous fiscal year, has been completed, and a contract awarded for the construction of 3,770 linear feet of stone wall along the western and southern boundaries of the reservation to inclose an addition to the national cemetery, authorized January 11, 1897.

At the Barrancas (Fla.) National Cemetery, a wooden flagstaff 65 feet in length has been erected.

At the Baton Rouge (La.) National Cemetery, the rostrum contracted for during the previous fiscal year has been completed, and a system for underdraining the lodge provided to prevent further settling of the walls, preparatory to repairing the same.

At the Battle Ground (D. C.) National Cemetery, repairs were made to the inclosing wall, lodge, outbuilding, water supply, and drainage, and an iron flagstaff 50 feet in length, removed from Arlington National Cemetery, erected.

At the Beaufort (S. C.) National Cemetery, the rostrum contracted for during the previous fiscal year has been completed.

At the Camp Butler (Ill.) National Cemetery, the rostrum contracted for during the previous fiscal year has been completed, and necessary repairs made to the lodge, outbuildings, inclosing wall, and drainage.

At the Chalmette (La.) National Cemetery, the brick outbuilding contracted for during the previous fiscal year has been completed, and repairs made to the lodge and water supply.

At the Chattanooga (Tenn.) National Cemetery, repairs were made to the inclosing walls and gates, the driveways put in good order, and the outbuilding which was damaged by fire August 10, 1896, thoroughly repaired.

At the Corinth (Miss.) National Cemetery, the lodge, outbuildings, and drainage were repaired, and a new wooden flagstaff 65 feet in length erected.

At the Custer Battlefield (Mont.) National Cemetery, repairs were made to the water supply, and a wooden flagstaff 65 feet in length erected.

At the Finns Point (N. J.) National Cemetery, repairs were made to the lodge, and 244 cubic yards of stone riprap placed along the inclosing wall at the river bank to protect the foundation of the wall during high water.

At the Fort McPherson (Nebr.) National Cemetery, the lodge, inclosing wall, and water supply were repaired, and a brick stable erected.

At the Fredericksburg (Va.) National Cemetery, repairs were made to the inclosing wall, lodge, outbuilding, water supply, and drainage.

At the Glendale (Va.) National Cemetery, repairs were made to the lodge and an addition to the outbuilding constructed.

At the Jefferson Barracks (Mo.) National Cemetery, repairs were

made to the lodge, outbuildings, and drainage, and the inclosing walls repaired and repointed.

At the Marietta (Ga.) National Cemetery, the water supply was improved by connection with the city main.

At the Mound City (Ill.) National Cemetery, the iron fence inclosing the cemetery was repaired and painted.

At the Natchez (Miss.) National Cemetery, a wooden flagstaff 65 feet in length was ordered to replace the iron flagstaff damaged April 30, 1897, while being repaired.

At the Poplar Grove (Va.) National Cemetery, the rostrum contracted for during the previous fiscal year was completed.

At the Salisbury (N. C.) National Cemetery, the rostrum contracted for during the previous fiscal year was completed.

At the San Francisco (Cal.) National Cemetery, repairs were made to the lodge. A white bronze monument, surmounted by a statue of a soldier, was erected by the "Regular Army and Navy Union" in the center of plot 7, on the east side of the cemetery, and was unveiled with appropriate ceremonies on Decoration Day.

The stone wall contracted for during the previous fiscal year to inclose the addition to the cemetery, authorized February 29, 1896, has been completed.

At the Santa Fe (N. Mex.) National Cemetery, repairs were made to the lodge, outbuilding, and drainage, and a wooden flagstaff 65 feet in length erected to replace one destroyed by lightning July 13, 1896.

At the Winchester (Va.) National Cemetery, the water supply was improved by connection with the city waterworks.

At all the national cemeteries necessary repairs were made and the grounds properly cared for.

Soldiers' lots.—For the soldiers' lot, owned by the United States, in the city cemetery, Mound City, Kans., a wooden flagstaff 60 feet in length was provided and a national flag supplied.

A statement showing the expenditures at the several national cemeteries is submitted herewith, marked "A."

Very respectfully,

J. T. FRENCH, Jr.,
Captain and Assistant Quartermaster, United States Army.

The QUARTERMASTER-GENERAL.

A statement of the disbursements of appropriations for national cemeteries during the fiscal year ending June 30, 1897.

Name of cemetery.	Amount.	Name of cemetery.	Amount.
Alexandria, La	$685.95	Keokuk, Iowa	$245.87
Alexandria, Va	722.19	Knoxville, Tenn	528.71
Andersonville, Ga	887.24	Lebanon, Ky	384.56
Annapolis, Md	459.43	Lexington, Ky	60.00
Antietam, Md	726.40	Little Rock, Ark	955.83
Arlington, Va	24,259.53	Loudon Park, Md	669.83
Balls Bluff, Va	25.00	Marietta, Ga	1,306.12
Barrancas, Fla	629.60	Memphis, Tenn	1,448.88
Baton Rouge, La	1,726.92	Mexico City, Mex	564.69
Battle Ground, D. C	284.87	Mill Springs, Ky	282.60
Beaufort, S. C	1,338.37	Mobile, Ala	179.34
Beverly, N. J	367.33	Mound City, Ill	1,018.24
Brownsville, Tex	862.70	Nashville, Tenn	2,579.62
Camp Butler, Ill	1,212.16	Natchez, Miss	838.80
Camp Nelson, Ky	487.17	New Albany, Ind	379.51
Cavehill, Ky	128.46	Newbern, N. C	494.66
Chalmette, La	4,016.80	Philadelphia, Pa	1,227.15
Chattanooga, Tenn	4,172.21	Poplar Grove, Va	1,394.86
City Point, Va	1,115.88	Port Hudson, La	496.29
Cold Harbor, Va	350.14	Quincy, Ill	25.00
Corinth, Miss	1,590.44	Raleigh, N. C	322.07
Crown Hill, Ind	10.00	Richmond, Va	1,512.90
Culpeper, Va	587.71	Rock Island, Ill	400.00
Custer Battlefield, Mont	772.24	Salisbury, N. C	1,578.26
Cypress Hills, N. Y	1,958.85	San Antonio, Tex	250.50
Danville, Ky	100.00	San Francisco, Cal	5,569.62
Danville, Va	408.13	Sante Fe, N. Mex	1,311.03
Fayetteville, Ark	680.00	Seven Pines, Va	294.63
Finns Point, N. J	314.74	Shiloh, Tenn	988.24
Florence, S. C	322.29	Soldiers' Home, District of Columbia	1,334.26
Fort Donelson, Tenn	389.65	Springfield, Mo	399.27
Fort Gibson, Ind. T	408.25	St. Augustine, Fla	75.00
Fort Harrison, Va	454.98	Staunton, Va	235.60
Fort Leavenworth, Kans	1,213.71	Stones River, Tenn	895.86
Fort McPherson, Nebr	1,672.66	Vicksburg, Miss	3,486.59
Fort Scott, Kans	500.19	Wilmington, N. C	288.55
Fort Smith, Ark	553.12	Winchester, Va	711.74
Fredericksburg, Va	1,431.14	Woodlawn, N. Y	114.50
Gettysburg, Pa	929.84	Yorktown, Va	210.41
Glendale, Va	517.21	Soldiers' lots	347.14
Grafton, W. Va	241.16	Miscellaneous	2,806.56
Hampton, Va	852.47		
Jefferson Barracks, Mo	2,280.35	Total	101,062.32
Jefferson City, Mo	201.55		

REPORT OF THE COMMISSARY-GENERAL OF SUBSISTENCE.

REPORT

OF THE

COMMISSARY-GENERAL OF SUBSISTENCE.

WAR DEPARTMENT,
OFFICE COMMISSARY-GENERAL OF SUBSISTENCE,
Washington, D. C., October 1, 1897.

SIR: I have the honor to submit the following report of the operations of the Subsistence Department for the fiscal year ending June 30, 1897.

RESOURCES AND EXPENDITURES.

The following statement exhibits the aggregate fiscal resources and expenditures of the Department for the year mentioned and the balances at the close of the fiscal year:

RESOURCES.

Amounts in the Treasury to the credit of the appropriations of the Subsistence Department on June 30, 1896, as follows:		
Subsistence of the Army, 1895	$21,309.78	
Subsistence of the Army, 1896	154,881.64	
Subsistence of the Army, certified claims, act June 8, 1896	7.12	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough—		
Certified claims, act March 2, 1889, and April 4, 1890	2,044.11	
Certified claims, 1895, act August 18, 1894	9,975.25	
Certified claims, 1896, act March 2, 1895	6,986.25	
Claims for quartermaster stores and commissary supplies, acts July 4, 1864, and March 2, 1895	.08	
		$195,204.23
Amounts to the credit of officers of the Subsistence Department, and of officers doing duty in the Subsistence Department, with the Treasurer, assistant treasurers, and designated depositaries, and in their personal possession, on June 30, 1896, as follows:		
Subsistence of the Army, 1896	107,796.26	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough—		
Certified claims, 1895, act August 18, 1894	197.85	
Certified claims, 1896, act March 2, 1895	756.57	
		108,750.68
Amounts refunded to the Treasury near close of fiscal year 1896, but not carried to the credit of the appropriations by June 30, 1896, as follows:		
Subsistence of the Army, 1896		11,953.47

Amounts appropriated for the Subsistence Department for the fiscal year ending June 30, 1897, as follows:		
Subsistence of the Army, 1897, act of March 16, 1896.	$1,650,000.00	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough—		
Certified claims, 1897, act of June 11, 1896.....	4,000.00	
Relief of sufferers from overflow of Mississippi River and its tributaries and the Red River of the North—joint resolution approved April 7, 1897...	200,000.00	
		$1,854,000.00
Amounts collected from various sources and refunded to the appropriations of the Subsistence Department on the books of the Treasury during the fiscal year 1897, as follows:		
Subsistence of the Army, 1894, and prior years.....	87.09	
Subsistence of the Army, 1894, and prior years, transfer account	6.62	
Subsistence of the Army, 1895.....	25.56	
Subsistence of the Army, 1896.....	951.26	
Subsistence of the Army, 1897.....	144.66	
		1,215.19
Amounts received by officers of the Subsistence Department and by officers doing duty in the Subsistence Department from sales of subsistence stores to the following purchasers during the fiscal year 1897, and taken up for immediate disbursement under the following appropriations:		
Subsistence of the Army, 1896: Sales to officers, $847.34; to enlisted men, companies, detachments, and hospitals, $2,230.65; to post exchange, $426.91.	3,504.90	
Subsistence of the Army, 1897: Sales to officers, $253,170.87; to enlisted men, companies, detachments, and hospitals, $326,655.91; to post exchanges, $27,831.33; to civilian employees, $10,731.94; to Quartermaster's Department, $48.07; to Indian agents and employees, $2,654.03; headquarters Army, 84 cents; to circuit court commission, $90.22; to naval officers, $86.44; to Bureau Ethnology, Smithsonian Institution, $124.03; of garden seeds, $239.50; of surplus and condemned stores and property at auction, $597.71; of boxes, barrels, etc., $222.03.....	622,452.92	
Relief of sufferers from overflow of Mississippi River and its tributaries and the Red River of the North—joint resolution approved April 7, 1897: Sales at auction.....	51.77	
		626,009.59
Amounts taken up by officers doing duty in the Subsistence Department on account of reclamations for stores lost, damaged, etc., and in correction of errors in their accounts, etc., during the fiscal year 1897:		
Subsistence of the Army, 1897.....	1,078.05	
Relief of sufferers from overflow of Mississippi River and its tributaries and the Red River of the North—joint resolution approved April 7, 1897, correction of errors	443.66	
		1,521.71
Amounts charged against officers still in the service on account of funds and stores alleged to have been lost by theft, etc., for which relief can only be obtained in Court of Claims under sections 1059 and 1062, Revised Statutes, or from Congress, as follows:		
Subsistence of the Army, 1880.....	75.92	
Subsistence of the Army, 1889.....	24.04	
		99.96
Total resources		2,798,754.83

EXPENDITURES.

Amounts expended on the books of the Treasury from the appropriations of the Subsistence Department during the fiscal year 1897, as follows:		
Subsistence of the Army, 1894, and prior years, transfer account	$6.62	
Subsistence of the Army, 1895	197.79	
Subsistence of the Army, 1896	2,146.21	
Subsistence of the Army, 1897	2,135.80	
Subsistence of the Army, certified claims, act June 8, 1896	7.12	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough—		
Certified claims, 1897, act June 11, 1896	14.87	
		$4,508.41
Amounts disbursed by officers of the Subsistence Department and officers doing duty in the Subsistence Department during the fiscal year 1897, as follows:		
Subsistence of the Army, 1896	82,246.43	
Subsistence of the Army, 1897	1,972,702.83	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough—		
Certified claims, 1895, act August 18, 1894	2.25	
Certified claims, 1896, act March 2, 1895	156.09	
Certified claims, 1897, act June 11, 1896	2,891.80	
Relief of sufferers from overflow of Mississippi River and its tributaries and the Red River of the North—joint resolution approved April 7, 1897	71,170.70	
		2,129,170.10
Amounts dropped by officers doing duty in the Subsistence Department in correction of errors in their accounts during the fiscal year 1897:		
Subsistence of the Army, 1896	1.00	
Subsistence of the Army, 1897	134.58	
		135.58
Amounts carried to the surplus fund on June 30, 1897:		
Subsistence of the Army, 1894, and prior years	87.09	
Subsistence of the Army, 1895	21,137.55	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough—		
Certified claims, 1895, act August 18, 1894	10,170.85	
		31,395.49
Total expenditures		2,165,209.58

BALANCES.

Amounts in the Treasury to the credit of the appropriations of the Subsistence Department on June 30, 1897, as follows:		
Subsistence of the Army, 1896	194,693.89	
Subsistence of the Army, 1897	203,849.89	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough—		
Certified claims, acts March 2, 1889, and April 4, 1890	2,044.11	
Certified claims, 1896, act March 2, 1895	7,586.73	
Certified claims, 1897, act June 11, 1896	485.13	
Claim for quartermaster stores and commissary supplies, acts July 4, 1864, and March 2, 1895	.08	
Relief of sufferers from overflow of Mississippi River and its tributaries and the Red River of the North—joint resolution approved April 7, 1897	108,685.11	
		517,344.94

Amounts to the credit of officers of the Subsistence Department and of officers doing duty in the Subsistence Department, with the Treasurer, assistant treasurers, and designated depositaries, and in their personal possession, on June 30, 1897, as follows:		
Subsistence of the Army, 1897	$63,893.77	
Commutation of rations to prisoners of war in rebel States and soldiers on furlough—		
Certified claims, 1897, act June 11, 1896	608.20	
Relief of sufferers from overflow of Mississippi River and its tributaries and the Red River of the North—joint resolution, approved April 7, 1897	20,639.62	
		$85,141.59
Amounts refunded to the Treasury near close of fiscal year 1897, but not carried to the credit of the appropriation by June 30, 1897, as follows:		
Subsistence of the Army, 1897		30,958.76
Amounts charged against officers still in the service on account of funds and stores alleged to have been lost by theft, etc., for which relief can only be obtained in the Court of Claims under sections 1059 and 1062, Revised Statutes, or from Congress as follows:		
Subsistence of the Army, 1880	75.92	
Subsistence of the Army, 1889	24.04	
		99.96
Total balances		633,545.25

EXPERIMENTAL TRIAL OF THE EMERGENCY RATION.

An experimental trial of the emergency ration established by General Order No. 49, Headquarters Army, 1896, was undertaken by Troop E, First Cavalry, at Fort Sill, Okla., upon a twelve days' practice march in May, 1897. The commanding officer of the troop on this march had been the recorder of the board which, under Special Order No. 74, Headquarters Army, 1896, had examined the reports of the several military department boards and the views of the Major-General Commanding the Army and the Commissary General of Subsistence concerning the proper rations for troops operating in emergencies; and the troop was accompanied on the march by the medical officer who had been a member of that board, a copy of whose report is hereto appended.

This march was made the occasion for the first practical test of the emergency ration. For the first two days the men were subsisted on the full field ration, and for the remaining ten days officers and men came down to the half-allowance emergency ration prescribed by General Order No. 49. The march was generally across country, off wagon roads, and the average number of miles covered per day in the ten days' test was 21. The weather up to the last two days of the march was exceptionally fine, and then heavy and almost continuous rains set in.

The test was made under conditions in which the men were not affected by the excitements, anxieties, and fatigues attendant upon dangerous proximity to, or actual conflict with, an enemy. As a test under the conditions given, the results seem to go a long way toward establishing the efficiency of the emergency ration as a means of sustaining the muscular power and activity of men under prolonged physical strain; but its full efficiency needs yet to be tested by men situated in or moving in a more critical environment.

RELIEF OF SUFFERERS FROM OVERFLOW OF THE MISSISSIPPI RIVER AND ITS TRIBUTARIES, THE RED RIVER OF THE NORTH, AND THE RIO GRANDE AT EL PASO, TEX.

The Subsistence Department was charged by the Secretary of War with the duty of purchasing and distributing the subsistence supplies directed by the joint resolutions of April 7 and June 9, 1897, to be furnished to destitute persons requiring assistance in the districts overflowed by the Mississippi River and its tributaries, by the Red River of the North, and by the Rio Grande at El Paso, Tex. Maj. H. G. Sharpe, C. S., Capt. D. L. Brainard, C. S., and Capt. George B. Davis, C. S., were assigned to this duty. Major Sharpe was assisted by Lieut. C. A. Hedekin, Third Cavalry, and Lieut. J. M. T. Partello, Fifth Infantry; Capt. Brainard by Lieut. J. Pope, jr., Lieut. J. T. Honeycutt, and Lieut. W. L. Kenly, all of the First Artillery; and Captain Davis by Lieut. E. C. Carnahan, Fifth Infantry, Lieut. Matthias Crowley, Fifth Infantry, Lieut. R. S. Turman, Sixth Infantry, Lieut. E. T. Cole, Sixth Infantry, and Lieut. H. H. Pattison, Third Cavalry. These officers of the line were specially detailed by the Secretary of War for this duty, and they rendered efficient service in connection with the distribution of stores.

Major Sharpe was stationed at St. Louis, and afterwards at Cairo and Memphis; Captain Brainard at New Orleans; and Captain Davis at Vicksburg and Memphis.

MISSISSIPPI RIVER AND ITS TRIBUTARIES.

The distribution by Major Sharpe was generally made upon the basis of the so-called "plantation ration," consisting of 7 ounces of salt meat, 26 ounces of corn meal, and one-half pint of molasses. The daily allowance for animals was 6 pounds corn and 6 pounds hay. He estimates the quantities distributed by him to be 205,910 rations for sufferers, at a cost of 2.938 cents per ration; and 79,045 forage rations, at 3.857 cents per ration. Two thousand packages of seeds received from the Department of Agriculture were also distributed. The following is a statement of the stores in bulk purchased by him, and the distribution made of same, viz:

States in which distributed.	Salt meat.	Flour.	Corn meal.	Rice.	Hominy.	Salt.	Sirup.	Sorghum.	Molasses.	Hay.	Corn.
	Lbs.	*Bbls.*	*Bbls.*	*Lbs.*	*Bbls.*	*Bbls.*	*Galls.*	*Galls.*	*Galls.*	*Lbs.*	*Lbs.*
Missouri	17,698	61	154	1,595	7½	9	383	165	213	12,000	.....
Kentucky	2,972	5½	34	93	½	1	221	.....	55	.....	.....
Arkansas	9,908	7	149	200	.....	.....	110	.....	1,005	153,888	134,497
Tennessee	11,950	37	159	500	3	2	330	662	106	5,000	.....
Mississippi	27,539	.....	511½	.....	.....	.....	.....	.....	3,633.5	147,815	144,478
Total	70,067	110½	1,007½	2,388	11	12	1,044	827	5,012.5	318,703	278,975

The distribution by Captain Davis was also upon the basis, generally, of a plantation allowance, consisting of 3 pounds of pork, 12 pounds of corn meal, and one-half pint of molasses where there were children, per person per week, in the case of children the molasses in a measure taking the place of the pork. He estimates the quantities distributed by him to amount to 565,166 rations for sufferers, at a cost of 3.268 cents per ration, and 259,399 forage rations, at 4.168 cents per

ration. The following is a statement of the stores in bulk purchased by him and distribution made of same, viz:

States in which distributed.	Pork.	Ham.	Lard.	Flour.	Corn meal.	Yeast powder.	Macaroni.	Rice.	Onions.	Coffee, roasted.	Tea.
	Lbs.	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Cans.*	*Lbs.*	*Lbs.*	*Pks.*	*Lbs.*	*Lbs.*
Missouri	842	.....	.....	.....	5,280	.....	.....	.....	.....	.....	.....
Arkansas	83,822	38	30	73½	317,260	6	15	.....	3	.....	.....
Tennessee	20,083	.....	.....	2,940	69,120	.....	.....	200	.....	150	5
Mississippi	131,488	.....	.....	2,352	536,440	.....	.....	.....	.....	.....	.....
Louisiana	3,405	.....	.....	.....	12,952	.....	.....	.....	.....	.....	.....
Total	239,640	38	30	5,365½	941,052	6	15	200	3	150	5

States in which distributed.	Sugar.	Molasses.	Salt.	Corn.	Oats.	Hay.	Bran.	Cotton-seed hulls.	Gnat oil.	Soap.
	Lbs.	*Galls.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Lbs.*	*Galls.*	*Lbs.*
Missouri	.....	52	.....	21,460	.....	30,312	.....	.....	.....	.....
Arkansas	.....	4,648	.....	241,887	.....	633,629	5,960	89,184	328	.....
Tennessee	363	1,332	1,400	87,992	.....	131,724	42,875	30,366	10	300
Mississippi	.....	5,272	.....	236,829	18,414	379,478	.....	49,900	35	.....
Louisiana	.....	.....	.....	1,072	.....	1,590	.....	1,100	.....	.....
Total	363	11,304	1,400	589,240	18,414	1,176,733	48,835	170,550	373	300

The distribution by Captain Brainard was upon the basis, generally, of 8 ounces of salt meat, 16 ounces of corn meal, and 1 gill of molasses for sufferers, and the allowance for animals was irregular in amount. He estimates the quantities distributed by him to be 159,377 rations for sufferers, at a cost of 3.7944 cents per ration; and 85,632 rations for animals, at 5.1334 cents per ration. In addition, $128.10 worth of medicines were distributed, as well as 1,000 packages of vegetable seeds received from the Department of Agriculture. The following is a statement of the stores in bulk purchased and distributed by him, viz:

State in which distributed.	Bacon.	Corn meal.	Molasses.	Hay.	Corn.	Oats.
	Pounds.	*Pounds.*	*Gallons.*	*Pounds.*	*Pounds.*	*Pounds.*
Louisiana	78,709	159,624	4,870	277,295	378,965	4,000

The relief committee of Canton, Mo., was authorized by the Secretary of War to purchase and distribute $1,166.39 worth of stores for the relief of persons in that town and vicinity.

RED RIVER OF THE NORTH.

By authority of the Secretary of War, the mayors of the following places were authorized to purchase and distribute stores to sufferers by the overflow of the Red River of the North, and they were reimbursed in the amounts herein stated, viz: Mayor of Pembina, N. Dak., $294.98; of St. Vincent, Minn., $600; of Hallock, Minn., $302.70; of Drayton, N. Dak., $499.95; of Grand Forks, N. Dak., $671.86; of East Grand Forks, Minn., $600; and of Moorhead, Minn., $1,112.78.

RIO GRANDE RIVER IN THE VICINITY OF EL PASO, TEX.

Under the joint resolution of June 9, 1897, Captain Davis purchased subsistence stores and turned them over to the mayor of El Paso for distribution to destitute persons in the district overflowed by the Rio

Grande. The basis of the distribution was an allowance of $4\frac{3}{8}$ pounds of flour, 2 pounds of pork, $2\frac{3}{16}$ pounds beans per person per week. He estimates the quantities distributed to be 13,804 rations, at a cost of 3.476 cents per ration. The following is a statement of the stores in bulk purchased and turned over, viz:

Where distributed.	Pork.	Flour.	Beans.	Coffee.	Sugar.	Soap.	Salt.
	Pounds.	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*
El Paso, Tex.	3,853	8,624	4,176	50	50	300	500

DISBURSEMENTS FOR FLOOD SUFFERERS.

The expenses in connection with the relief of flood sufferers were as follows:

Relief on Mississippi River and tributaries:	
Disbursements by Maj. H. G. Sharpe, C. S.	$11,366.66
Disbursements by Capt. D. L. Brainard, C. S.	12,891.57
Disbursements by Capt. George B. Davis, C. S.	44,393.91
Disbursements by relief committee, Canton, Mo.	1,166.39
Outstanding indebtedness, Oakville, Iowa	598.74
Relief on Red River of the North:	
Disbursements by mayors in region of Red River of the North	4,082.27
Outstanding indebtedness, Grand Forks, N. Dak.	802.39
Relief on Rio Grande at El Paso, Tex.:	
Disbursements by Capt. George B. Davis, C. S.	579.44
Total expenses	75,881.37

After the payment of a small amount for clerical services and other small expenses in addition to the above, the unexpended portion of the appropriation of $200,000 will be carried as an entirety to the surplus fund.

ISSUES TO INDIANS.

To whom made.	Value of issues.
Apache Indian prisoners at Fort Sill, Okla. (Army appropriation act, March 16, 1896)	$8,448.55
Indian prisoners at Fort Grant, Ariz	19.69
Indians visiting military posts (Rev. Stat., 2110)	91.87
British Cree Indians deported and delivered to the Canadian authorities (act of Congress approved May 13, 1896)	360.87
Total	$8,920.98

MISCELLANEOUS EXPENDITURES.

For liquid coffee there was expended $4,285.64, an increase over previous year of $1,277.24; for extra-duty service, $20,803.65, an increase of $622.26; for advertising, $4,197.61, a decrease of $381.06; for meals for recruiting parties and recruits, $35,487.77, a decrease of $7,975.90.

LOSSES OF STORES AND PROPERTY.

The value of the stores lost by accident, by wastage in transportation, while in store, etc., during the year, for which no one was held responsible, was $2,758.16, being greater by $354.91 than that of similar losses in the previous year.

Supplies lost during the year for which responsibility was fixed amounted to $263.95, of which $233.91 has been collected, leaving still to be collected $30.04. Above shows a very large decrease from losses of like character for a number of years, except in 1895, when like losses amounted to but $183.58.

SALE OF CONDEMNED AND OBSOLETE STORES.

	Subsistence stores.		
	Condemned.	Obsolete.	Total.
Original cost	$2,350.70	$700.36	$3,051.06
Amounts realized from sales	174.54	202.36	376.90
Loss	2,176.16	$498.00	2,674.16

A decrease from previous year in stores condemned of $594.92, and in obsolete stores of $1,366.53. From sales of condemned subsistence property there was realized the sum of $220.81.

CREDIT SALES.

Sales to officers reported as credit sales and not deducted on pay accounts amount to $86.94; the sales to enlisted men on credit amounted to $1,646.26; and the collections therefrom during the year on muster and pay rolls, and final statements, on account of credit sales in the current and previous fiscal years, amounted to $1,429.46.

COMMISSARY SERGEANTS.

The number of commissary sergeants in service at the beginning of the fiscal year was 90. During the year 15 were appointed; 1 died, 2 were discharged, and 12 were retired; leaving 90 in service at the end of the year.

CLERICAL FORCE, OFFICE COMMISSARY-GENERAL OF SUBSISTENCE.

I earnestly invite attention to the recommendation made in the annual estimate for salaries in this office for the fiscal year ending June 30, 1899 (see Book of Estimates, fiscal year 1899), and urgently request that the rearrangement of the clerical force in accordance with that estimate be authorized by Congress at its next session, so that the classification shall be as follows:

Chief clerk	$2,000
Two clerks of class 4	3,600
Two clerks of class 3	3,200
Four clerks of class 2	5,600
Thirteen clerks of class 1	15,600
Ten clerks, at $1,000 each	10,000
Two assistant messengers, at $720 each	1,440
Two laborers, at $660 each	1,320
Total	42,760

This rearrangement has met the approval of several preceding Secretaries of War, and does not increase the amount to be appropriated for the clerical force over the amount annually appropriated.

CLERICAL WORK OF THE OFFICE OF THE COMMISSARY-GENERAL OF SUBSISTENCE.

	Accounts current.	Returns of subsistence stores.	Returns of subsistence property.	Total.
On hand June 30, 1896	13	58	2	73
Received during fiscal year 1897	1,854	1,396	480	3,730
Total	1,867	1,454	482	3,803
Examined during the year	1,863	1,414	481	3,758
On hand June 30, 1897	4	40	1	45

The examination of the accounts current required the verification of 34,010 vouchers; the returns of subsistence stores, 23,107 vouchers; and the returns of subsistence property, 1,208 vouchers. The accounts were rendered by 269 officers.

In connection with the examinations 2,293 postal cards were used, 2,315 letters and 2,008 indorsements written and recorded, and 180 papers copied.

Contracts for supplies, etc., to the number of 341, were received and acted on.

Certificates of services as acting commissary of subsistence were issued to the number of 437, and of nonindebtedness to the number of 197.

Statement showing the number of claims on hand, received, and disposed of during the fiscal year ending June 30, 1897.

	Claims for commutation of rations while held as prisoners of war in rebel States.	Claims for commutation of rations while on furlough, and miscellaneous claims.	Total.
There were on hand June 30, 1896	17	30	47
Received during the fiscal year	296	194	490
Total	313	224	537
Disposed of during year	286	203	489
On hand June 30, 1897	27	21	48

The number of letters and indorsements written during the year in connection with the above claims was 1,805.

DUTIES AND STATIONS OF OFFICERS OF THE SUBSISTENCE DEPARTMENT.

A roster of the officers of the Subsistence Department on June 30, 1897, showing their duties and stations on that date, and the duration of their present assignments, is hereto appended.

Very respectfully,

THOS. C. SULLIVAN,
Commissary-General of Subsistence.

Hon. RUSSELL A. ALGER,
Secretary of War.

Roster of the Subsistence Department, United States Army, June 30, 1897.

Name and rank.	Duty and station.	Assigned to present station.
COMMISSARY-GENERAL OF SUBSISTENCE.		
Brigadier-General.		
Thomas C. Sullivan	Commissary-General of Subsistence, Washington, D. C.	Jan. 18, 1897
ASSISTANT COMMISSARIES-GENERAL OF SUBSISTENCE.		
Colonels.		
William H. Bell	Principal assistant to the Commissary-General of Subsistence, Washington, D. C.	Mar. 19, 1897
Samuel T. Cushing	Assistant to the Commissary-General of Subsistence, Washington, D. C.	May 3, 1894
Lieutenant-Colonels.		
William A. Elderkin	Chief commissary, Department of the Missouri, Chicago, Ill.	May 9, 1896
William H. Nash	Purchasing commissary, old Custom-House building, St. Louis, Mo.	Apr. 20, 1897
Charles P. Eagan	Chief commissary, Department of California, San Francisco, Cal.	Aug. 3, 1892
COMMISSARIES OF SUBSISTENCE.		
Majors.		
John F. Weston	Purchasing commissary, New York City	May 29, 1896
Charles A. Woodruff	Chief commissary, Department of the East, Governors Island, N. Y.	May 27, 1896
John J. Clague	Chief commissary, Department of Dakota, and purchasing commissary, St. Paul, Minn.	Feb. 8, 1892
Wells Willard	Assistant to the purchasing commissary, Army building, New York City.	Apr. 18, 1895
Henry G. Sharpe	Purchasing commissary, 159 High street, Boston, Mass.	June 30, 1897
Frank E. Nye	Chief commissary, Department of the Platte, and purchasing commissary, Omaha, Nebr.	Apr. 25, 1894
William L. Alexander	Chief commissary, Department of the Colorado, and purchasing commissary, Denver, Colo.	Mar. 24, 1894
Henry B. Osgood	Under orders for duty as purchasing commissary, Denver, Colo.	
Captains.		
Oskaloosa M. Smith	Purchasing commissary, 250 Illinois street, Chicago, Ill.	Oct. 31, 1895
Edward E. Dravo	Chief commissary, Department of Texas, and purchasing commissary, San Antonio, Tex.	July 10, 1896
Abiel L. Smith	Purchasing commissary, 716 New York Life Building, Kansas City, Mo.	June 30, 1893
Tasker H. Bliss	On special duty under direction of the Secretary of War, Washington, D. C.	June 30, 1897
James N. Allison	Chief commissary, Department of the Columbia, and purchasing commissary, Vancouver Barracks, Wash.	Apr. 10, 1897
William H. Baldwin	Purchasing commissary, 36 New Montgomery street, San Francisco, Cal.	Jan. 31, 1897
David L. Brainard	Purchasing commissary, 1201 Prytania street, New Orleans, La.	Mar. 31, 1897
George B. Davis	On temporary duty in Office Commissary-General of Subsistence, connected with relief of sufferers from overflow of Mississippi River and its tributaries, Washington, D. C.	June 28, 1897

During the last fiscal year the following casualty occurred in the Subsistence Department:
Brig. Gen. Michael R. Morgan, Commissary-General of Subsistence, retired January 18, 1897, by operation of law (section 1, act of June 30, 1882).

APPENDIX.

REPORT OF A PRACTICAL TEST OF THE USE OF THE EMERGENCY RATION BY UNITED STATES TROOPS ON ACTIVE SERVICE.

The emergency ration was authorized and announced in General Orders, No. 49, Headquarters of the Army, Adjutant-General's Office, Washington, December 5, 1896. These orders were based on the recommendations of a board of officers convened by Special Order 74, Adjutant-General's Office, March 28, 1896, of which board I had the honor to be chairman. The board was called upon to make recommendations on the subject of an emergency ration, and to report upon the minimum amount of articles of food necessary to sustain a soldier in health and activity while in active service in the field for a limited period. This at first sight seemed a great responsibility; but to aid it in its deliberations the board had the benefit of the well-considered views of no less than forty officers of experience, for in each of the eight military departments a board had already been convened, each consisting of one medical, one subsistence, and three line officers, and the reports of these boards, together with the views of the Commissary General of Subsistence thereon, were among the materials submitted for the consideration of the War Department board aforesaid. The work of the eight departmental boards made that of the War Department board an easy one. The experience of the many officers constituting the various boards indicated so clearly the main points of consideration that the War Department board had before it little more than a work of verification. Practically, the result of its deliberations confirmed the average results reached by the departmental boards.

Certain propositions were accepted as proved by the experience of the members. An emergency, for instance, is no time to attempt a change of diet, hence all special articles prepared with the utmost care to supply the system with the theoretical amount of the theoretically needful nutrients must be set aside and only those articles be recommended for issue to the use of which the soldier is accustomed. Again, an emergency might occur at any time and special rations might not be on hand when wanted, therefore the emergency ration should consist of those articles which the Subsistence Department would have always on hand for the subsistence of troops. In other words, hard bread, bacon, and coffee should form the staples of the emergency ration; and to insure that there should be no misunderstanding on this head the board specified that the hard bread should be such as the Subsistence Department was then issuing for the use of troops, and a similar remark was made in regard to the bacon. Concerning the coffee, there seemed to be no room for misunderstanding. Pepper and salt were recommended as condiments, and tobacco as an accessory, which could not always be procured by private purchase in an emergency in war time. The only advanced steps taken by the board were the acceptance of saccharine instead of sugar, and for the weight of the sugar thus saved, the substitution of a weight of soup-making material (pea meal being suggested provisionally) containing a large percentage of protein, as this seemed necessary on scientific or theoretical grounds to complete the proper dietary.

In the published articles on the subject an emergency ration was assumed to be a minimum of diet, and the orders convening the War Department board appeared to imply the same view, but the board in its report made the unexpected proposition that this ration should consist of the maximum diet for hard labor. It was considered that there would be hard work ahead of troops ordered out on emergency service, and that, therefore, no restriction should, if possible, be placed on the amount of food available for the men. Emergencies would seldom last beyond a few days. The maximum diet for hard labor is set down by the scientific authorities at about 2 pounds. As the board considered that on an emergency the soldier could carry 10 pounds of food, it recommended that the ration should consist of 2 pounds, but that no more than five days' rations should be authorized to be carried. Thus if the emergency should last less than five days the soldier would always have the fullest diet to sustain him. This would provide for many of the emergencies of military service; but, on the other hand, should the emergency be expected to last for a longer period than five days? Here the board became confronted with the call to determine

the minimum amount of food necessary to sustain a soldier in health and activity for a limited period in active field service.

Physiologists are well acquainted with what is called subsistence diet. It is the diet that is needful to carry on the internal work of the human system, the work involved in the mere act of living, without consideration for active, live muscular work productive of external results. This is usually set down as about 16 ounces of water-free food. Parkes, in his widely known work on hygiene, gives the weight of subsistence diet as 15 or 16 ounces, not including coffee in this weight; and he states that although this will keep a man alive, it will probably not prevent him from losing weight, and therefore is not really sufficient. In consideration of this minimum, declared by the scientific and practical hygienists to be absolutely needful, the board decided that when an emergency occurred which was expected to continue for a longer period than five days, the command should be required to so use its five days' rations as to make them last for the expected number of days; but that ten days should be the limit of use of the five days' emergency rations, because, when made to last for this number of days, the men would be practically living on the subsistence diet of the physiologists, and all muscular work productive of external results would necessarily be at the expense of their own tissues. It was conceived that emergencies would rarely last for so long a period as ten days, but that when such an emergency did occur, it would be one of extreme gravity and of such a character as to call for self-sacrifice on the part of the troops. That they would lose weight on such a spare dietary was accepted; but it was considered by the board, from the experience of its members, that troops could undergo ten days of active service on the limited ration without material loss of efficiency and with no more injury to the constitution of the men than could be repaired by a week or two of full diet when the emergency was at an end.

The quality of the components of the ration was decided upon, so that while the whole ration should have the highest calorific value, its half should contain the proteids or nitrogenous principles of the physiologic subsistence diet.

It is needless to speak of the whole ration, its sufficiency being guaranteed by daily experience where hard bread, bacon, and coffee are used as food.

The ability of the soldier to pack on his person and carry five days' rations was a question to be determined by the experience of military men. The members of the War Department board concluded that it could be done, but left the details to be elaborated in the future. The report of Capt. W. C. Brown's test trip in Oklahoma Territory shows that the five rations, the required amount for an emergency of five or more days, can be carried by mounted men, and shows also what seems under present conditions to be the best mode of packing. Future experiments with infantry troops will determine this for them.

The sufficiency of the five days' rations, when spread over six or seven days, may also be taken for granted; but when spread over eight, nine, or ten days, when the physiologic subsistence diet was approached or reached, the practical question arose, Would the men be able to stand it? Would they, having food in their possession, be able to limit themselves to a small regulation allowance, or would they satisfy the cravings of the day and let the morrow look to itself? This was the uncertain question that could be decided only by a practical test—not by one or two men who might be enthusiasts, but by a military command composed of unselected men, many of whom should be young soldiers who had never undergone any privation or restriction of diet.

It fortunately happened that Lieut. W. C. Brown, who had been recorder of the War Department board, was shortly thereafter promoted to the captaincy of Troop E, First Cavalry, stationed at Fort Sill, Okla., and it occurred to this officer that from no other post in the United States could the sufficiency or inefficiency of the emergency ration be demonstrated so satisfactorily, because on account of the absence of settlers on the Indian reservation a command could march for the required number of days without having to camp or to pass within 20 or more miles of any settlement where the troops might obtain any articles of food unknown to their officers. Captain Brown represented this to the Adjutant-General of the Army, and requested permission to take his troop out to test the sufficiency of the ration when used for the maximum limit of ten days.

This permission was granted, and I was detailed by Special Order 87, Headquarters Army, Adjutant-General's Office, Washington, D. C., April 15, 1897, to accompany the command as its medical officer. The duty of a medical officer in this case involved more than the ordinary duty of a medical officer with an expeditionary column. It involved a special inquiry into the condition of the men as affected from day to day by the limited dietary.

To enable me to make this inquiry, I joined the command at Fort Sill, Okla., several days before the troop started on its march. Through the courtesy of the Quartermaster-General's Office, I obtained a portable platform scale by which the weight of the men could be taken when desired. From the Army Medical Museum

I procured two dynamometers, one of which determined the upward pull of the men, the other the muscular power of their arms. It was not the intention to use both of these, but the average relation between them was determined, so that if any accident destroyed the utility of the one in use the other might be substituted and its results be comparable with those already made and recorded. The dynamometer which recorded the upward pull was used throughout the expedition, as its efficiency continued unimpaired. It was made by Tiemann, of New York, and consisted of an elongated oblong steel spring with a dial plate and index to show in pounds avoirdupois the approximation of the sides of the oblong, when under strain from below upward. To use it: A strong iron hook was riveted into the center of a board, 2 feet long by 1 foot wide, and 2 inches thick. The soldier stood upon this board one foot on either side of the hook. He then caught the lower end of the oblong spring in the hook, adjusted a crossbar by means of the links of a chain to its upper end, and then with the crossbar in both hands pulled upward with all his strength. The muscles of the legs, loins, back, shoulders, and arms were all concerned in this effort to pull the hook out of the board.

From the Army Medical Museum I obtained also a portable filter the capacity and efficiency of which had been under test for some time in the bacteriological laboratory. It was incumbent upon me, as upon all medical officers with troops, to protect the men from all unnecessary exposures to insanitary influences; but in this instance I regarded it as especially needful to take no risks from impure water. In another communication (letter to the Surgeon-General, dated July 6, 1897) I have dealt with this subject at greater length and made appropriate recommendations. Diarrhea from impure water occurring in the command would interfere with the special object of the expedition. Such diarrheas might even be attributed to the diet. To protect the emergency ration, as well as to protect the men, I regarded it as essential to provide the command with pure water on the expedition, particularly as I understood that the surface waters of the region in which the march was to be made had a notoriously bad reputation. I was therefore gratified to find myself provided with a filter which had given satisfactory results in bacteriological experimentations.

During the few days of my stay at Fort Sill I examined the men who were to undertake the march, and found them all sound and hearty. The party consisted of two officers and forty-four men. With the exception of the officers and six of the men, they were all under 30 years of age, the average age being $27\frac{5}{12}$ years. The youngest man was $21\frac{3}{12}$, the oldest (myself), $55\frac{6}{12}$ years. Twenty-two of the men were under 24 years of age, and most of these had never been on field service before. The average height was that of the American soldier, 67.5 inches, the extremes being 64 and 72 inches. The average weight was 158 pounds, the extremes 140 and 188.

In connection with this expedition the Surgeon-General of the Army suggested the desirability of making a control experiment by having a detachment of troops undertake a ten days' march on full field rations, that a comparison of the condition of the men in the two commands might be made at the end of their march. Only one officer (Lieut. William H. Osborne) and nine men could be spared for this purpose. The average age of this party was $29\frac{8}{12}$, the extremes being $21\frac{9}{12}$ and $44\frac{5}{12}$; height 67.9 inches, the extremes 65.75 and 71.5; weight 163.4 pounds, the extremes 135 and 182 pounds.

The two commands marched from Fort Sill on the morning of Monday, May 17. They were accompanied by a wagon carrying rations for the men and grain for the horses, as it was the intention to keep the men on field service on full rations for two or three days before beginning the emergency march, the better to simulate the conditions that would be present in a case of actual emergency.

* * * The command as a whole lost weight during the two days' preliminary march while on full field rations, which loss must be attributed to the change from the quietude of garrison duty to the activity of field service. On the evening of May 15 the command of 46 officers and men weighed at Fort Sill 7,275 pounds, and on the evening of May 18, after a two days' march, their weight was 7,217.5 pounds, a loss of 57.5 pounds, or an average of 1.25 per man; but the loss was not thus evenly distributed, for seven men gained 10 pounds, or 1.43 pounds per man; nine remained unaltered in their weight, and thirty incurred a loss of 67.5 pounds, or 1.9 pounds per man. Four men lost 0.5, three 1, six 1.5, five 2, three 2.5, two 3, three 3.5, one 4, one 4.5, one 5, and one 6 pounds.

Of those who gained, three were light weights, one average, and three heavy weights, the greatest gains being 2 pounds by a man who weighed at starting 138 pounds and 3 pounds by one who weighed 171 pounds. These two men were respectively 64 and 72 inches. Five were under and two over 30 years of age.

The men who neither gained nor lost varied from 144 to 166.5 pounds, in height from 64.25 to 70 inches, and in age from $22\frac{7}{12}$ to $30\frac{5}{12}$; but five of them were under 23 years of age.

The thirty men who lost weight were men who weighed from 140 to 188 pounds. They varied in height from 64 to 70.25 inches, and in age from $21\frac{3}{12}$ to $55\frac{6}{12}$ years.

During this preliminary march members of the detachment intended for the control experiment were somewhat similarly affected in their weight. Of the ten in the party, three gained an aggregate of 4 pounds; two neither gained nor lost, while five lost an aggregate of 6.5 pounds.

On the morning of Wednesday, May 19, the detachment forming the control experiment moved out on its ten days' march, with its field rations on pack mules. After the departure of this detachment the emergency rations were distributed from the wagon, which was then dispatched to Fort Sill, leaving the command with no transportation except two mules on which were packed the platform scales, dynamometers, and filter, and a box containing a reserve supply of rations in case of the insufficiency of the official rations issued to the command. It may here be observed that there was no occasion to make use of these extra rations. The box was opened on the return of the command to Fort Sill to verify its contents and show that they had been untouched during the progress of the expedition. Each member of the command, officers included, then packed his rations in his haversack and saddlebags. In the bottom of the haversack were placed the coffee, saccharin, pea meal, salt, and pepper, with two 16-ounce boxes of hard bread on top. The bacon, wrapped in parchment paper, with one box of hard bread and the meat can were placed in the near saddlebag; the two remaining boxes of hard bread, with towel, soap, etc., in the off saddlebag, the cup on the rear strap of the near saddlebag, and the canteen on the off cantle ring. The command then mounted and the trial of the emergency ration was begun.

The average daily march of the troop was about 21 miles. The men could easily have made longer marches, but long marches would have been a test of the endurance of the horses rather than of the men. As it was, the men of the troop, through the untiring energy of their captain, were kept actively engaged either on the march or in camp from reveille until taps. Breakfast consisted of coffee, hard bread, and bacon; some of the men prepared soup over night, so that it required merely to be warmed up in the morning for breakfast. A few crackers with some coffee or pure water from the canteen made a satisfactory lunch, taken either during a halt on the march or immediately after reaching camp. Dinner or supper after stables constituted the meal of the day. Soup was always prepared at this time. Soldiers in frying bacon in the field run about two-thirds of the food material to waste. As the fat melts from the bacon in the pan in the process of frying, they tilt it into the fire and the resultant piece of crisp fried bacon weighs less than a third of the uncooked slice. Many of the men economized their bacon by frying their hard bread, previously softened in cold water, in the melted grease. I am aware that this practice is denounced by most authorities on dietetics, but I have yet to discover any harmful effect from this method of cooking either among healthy young soldiers or hardy old soldiers. Others utilized the whole of their bacon by chopping it into small fragments and boiling it with the pea-meal soup. In this way none of the fat was lost.

Inspection of rations was held on alternate days to check any tendency to an extravagant use of supplies. As a rule the men were careful and seldom had to be cautioned as to the shortage of any article of the ration. Under the conditions of this march there was no possibility for the men to procure unknown to their officers any addition to the food supply carried in their haversacks and saddlebags. On actual service the diet of the command could easily have been increased by killing large game, but as the object of the expedition would have been frustrated by any addition to the ration, no effort was made in this direction. The men recognized this, and on one occasion when a few mulberries were found in camp, the men made inquiry as to whether they could eat them without interfering with the experimental trial of the ration. On another occasion some wild onions were dug up at a halting place and brought into camp to season the pea-meal soup. These were the only additions to the ration which a few of the men had during the ten days' march. They were sapid substances and antiscorbutic, but as a food supply the weight used amounted to nothing.

During the march the men were bright, active, cheerful, and appeared to suffer in no way from their restricted diet. Every evening before stable call the command reported in blouse, campaign hat, and leggins to be weighed. Each took an interest in this process, and the weight recorded was usually verified by the man himself before he stepped from the scales. A similar interest was shown in the test of strength by the dynamometer. On several occasions the pulse rate was taken before the men were weighed. The intention was to have the heart beat noted while the men were standing at ease, but it was not possible to get this in all cases; some of the men just having been relieved from herd guard or other duty had the pulse accelerated by exercise. During the first seven days the weather was dry and favorable to accuracy in weighing. Heavy rains fell on the eighth and ninth days of the march. The weight of the men was taken on the eighth day, May 27, but the results were of no value, as they merely showed approximately how much moisture there was in the clothing. The evening of May 28 was so wet that the scales were not

unpacked. The wet weather of these two days showed how fortunate the expedition had been during the first seven days. Damp weather during the trip would have rendered accuracy in weighing impossible, for moisture in the clothing would have obscured the slight changes in weight from day to day.

The wear and tear of the human machine in keeping up the vital processes and maintaining the animal heat at its normal requires the expenditure of an amount of energy which has been variously stated by different authorities. Probably the lowest estimate of what is needful as subsistence diet is that given by Playfair, who calls for 14.5 ounces of water-free food, the proximate principles being protein 2 ounces, fat 5 ounces, and carbohydrates 12 ounces, furnishing to the system 137 grains of nitrogen and barely 3,000 grains of carbon and having an energy equal to 1,758 calories.

The half ration or daily allowance of food used by the command on its recent march consisted of 8 ounces hard bread, 5 ounces bacon, and 2 ounces pea meal, with coffee, saccharin, salt, pepper, and tobacco. Excluding the accessories and calculating the staples into their proximate principles, they are found to be composed of protein 2.128 ounces, fat 3.809 ounces, and carbohydrates 6.93 ounces, a total of only 12.867 ounces of water-free food. This allowance is considerably less than Playfair's minimum, but its reparative and calorific values are much greater. It furnishes 147 grains of nitrogen for the reparation of muscle, 3,159 grains carbon for respiratory purposes, and provides the system with an energy equal to 2,055 calories.

In accordance with the views of the authorities on dietetics it was to be anticipated that men on a diet of this kind would not only lose weight by having to utilize the carbon of their tissue, but would lose strength also on account of an insufficiency of nitrogen to repair muscular waste. It is generally accepted that on active service men should have at least 300 grains of nitrogen daily to provide for the repair of muscular tissues. Parkes mentions the experiments, but does not detail them, of a British medical officer in India, who found that men lost weight on active service when supplied with less than this quantity of nitrogen.

With the exception of a few ounces of pea meal, the whole of the five days' emergency rations was consumed by the expeditionary command, and it may be accepted that each man disposed of his own allowance. To go into detail would show that two or three of the young men had to be helped out by a handful of hard bread or a slice or two of bacon from some older comrade, that salt and pepper were in excess, and that saccharin was thought little of by many, who liked their coffee just as well without as with any sweetening, either of sugar or saccharin. It is to be observed that saccharin has no food value, and this appeared to be appreciated by the men. There was an excuse for the few men who had to go a little short on bacon during the last day or two in that this article of the ration had been issued in 50-ounce blocks, and it required an accurate eye to slice off the proper allowance for breakfast or dinner in the early days of the march. Had it been issued in five pieces of 10 ounces each, the young soldier would have been better able to recognize his daily allowance.

The loss of weight incurred by the command during the ten days' march on the limited ration was 135 pounds, or an average of 2.935 pounds per man. On May 18 the aggregate weight was 7,217.5, and on May 29, 7,082.5 pounds. But the loss was not evenly distributed. In fact, 5 individuals, including the commanding officer of the troop, gained in weight an aggregate of 7.5 pounds, and 2 men neither gained nor lost, so that a loss of 142.5 pounds was incurred by 39 men, or 3.654 pounds per man. This loss was as follows:

Number of men.	Loss in pounds per man.	Aggregate.	Number of men.	Loss in pounds per man.	Aggregate.
2	8.5	17	4	3	12
3	7	21	3	2.5	7.5
1	6.5	6.5	1	2	2
3	6	18	5	1.5	7.5
1	5.5	5.5	5	1	5
2	5	10	2	.5	1
4	4.5	18			
2	4	8	39		142.5
1	3.5	3.5			

On looking at [the table] which records the weighings made day by day in the field, to determine whether gain or loss of weight was influenced by age, it is readily seen that the men who suffered the greatest loss were mostly young soldiers. Of the 6 who lost from 6.5 to 8.5 pounds only 1 was over 22$\frac{5}{12}$ years of age, while those who gained in weight were much more advanced in years; but, on the other hand, 2 of 5

men who lost only 1.5 pounds were under 22 years of age, and one of these who neither gained nor lost was only 22½ years. The relation of the loss to age may be shown best by aggregating the men into three groups—those under 24, those between 24 and 30, and those over 30 years of age. Twenty-two were under 24, and these lost 87 pounds, or an average of 3.95 per man; 15 were between 24 and 30, and these lost 41.5 pounds, reduced to 40 pounds by a gain of 1.5 pounds on the part of 2 of their number, equaling an average loss of 2.66 per man: 9 men were over 30 years, and their loss was 14 pounds, reduced to 8 pounds by a gain of 6 pounds on the part of 3 of their number, equaling a loss of 0.89 pounds per man.

The relation of height to the gain or loss is not so clear, but it would seem that the tall men lost less than those who were under the average in height. None of the 8 men who lost 7.7 and 8.5 pounds each was over 67 inches, but inasmuch as those who gained were also under the average height, it is to be concluded that other conditions were much more powerful in their influence. Nevertheless, when the men are divided into two classes, those under 68 inches and those over that height, it is found that the former suffered the greater loss. Twenty-five men were under 68 inches in height, and these lost 84 pounds, reduced to 77.5 pounds by a gain of 6.5 pounds on the part of 4 of their number, equaling an average loss of 3.10 pounds; 21 men were over 68 inches in height, and these lost 58.5 pounds, reduced to 57.5 pounds by a gain of 1 pound on the part of 1 of their number, equaling an average loss of 2.74 pounds for the class.

Height and weight do not always go together, else the heavier men would have lost less than the lighter men, but, as a matter of fact, the heavier men lost relatively more than the lighter men. On starting from Fort Sill the mean weight was 158 pounds. Dividing the men into two groups, those above and those below this weight, it may be seen that in the former were 22 men and in the latter 24. The 22 men above the mean weight, aggregating 3,750 pounds, lost 83 pounds, or 2.21 per cent, equaling 3.77 pounds per man. The 24 men under the mean weight, aggregating 3,525 pounds, lost 59.5 pounds, reduced to 52 pounds by a gain of 7.5 on the part of 5 of their number, equivalent to a loss of only 1.48 per cent, or an average of 2.17 pounds per man. The mean height of the 22 men was 68.9 inches, their mean weight 170.5 pounds; the mean height of the 24 men was 66.25 inches, their weight 146.66 pounds.

Whatever may have been the influence of age, height, and weight on the loss of weight of the individual soldier it is certain that the manner in which the men cooked their bacon was an important factor in the case. It is to be regretted that careful observations were not made daily on this point. Every evening the officers of the command inspected the cooking processes at the various camp fires to show their interest in the welfare of the command, but no record was kept of each man's daily cooking. The majority of the men fried their bacon and lost two-thirds of the fat of the slices thus cooked. Some occasionally fried their hard bread in the melted fat and thus utilized a considerable quantity of it, and when they boiled the chopped bacon in their can of pea soup the whole of the fat was saved and ingested. These differences in the method of cooking make it evident that although each man had 50 ounces issued to him, and was reported as having consumed the whole of it, the men individually took into their systems very different quantities of that part of their ration which had the highest calorific value. Captain Brown, for instance, obtained the full value of his ration of bacon by using it all in soup, while I lost much of mine by having it all fried to a crisp. He gained in weight, I lost. We were nominally on the same ration, but actually used very different quantities of the hydrocarbon. It may be assumed that the other members of the command gained or lost more or less in accordance in part with their method of cooking their bacon.

The ration prescribed by the hygienic authorities for a soldier undergoing hard labor in the field consists of from 25.5 to 29.5 ounces of water-free food as compared with 12.86 ounces used by the men of E Troop, First Cavalry, on this expedition. It was therefore to be expected that the command would lose weight; but the facts that 5 gained in weight, that 2 neither gained nor lost, that the average loss in 27 of the 46 men did not exceed 3 pounds, and that in 36 of the 46 it did not exceed 5 pounds, although not all of the bacon was utilized, show that the estimate of the hygienists err on the side of liberality, and that men can do hard work and be in fine athletic condition for at least ten days on a much less generous dietary. It is to be observed also that not all of the loss of weight is to be attributed to the shortage of food, for the ten men of the control experiment lost weight, although they had all they desired to eat, and, in fact, turned in a certain percentage of their rations on their return to Fort Sill.

Their allowance per man per day was 12 ounces bacon, 11.2 hard bread, 3.4 flour, 2.4 beans, 1.2 sugar, and 16 potatoes, with coffee, salt, and pepper. Their mess was a common mess, and out of this each man ate as much as he desired. They turned in on their return 11.2 pounds bacon, 3 pounds hard bread, 20 pounds flour, 10 pounds beans, and 1.5 pounds sugar. The average quantity consumed daily per man was 10.2 ounces bacon, 11.2 hard bread, 2.2 flour, 0.8 beans, 16 potatoes, and 0.66 sugar.

This average was equivalent to a total per man of 26 ounces of water-free food, consisting of protein 3.32 ounces, fat 7.68 ounces, and carbohydrates 15 ounces. It furnished about 230 grains of nitrogen, 6,377 grains of carbon, and an energy 4,145 calories. Some of the men consumed more, some less, but all had as much as they cared to eat. Nevertheless, the detachment lost 13.5 pounds in weight, an average of 1.35 pounds per man during the ten days. Four gained in weight, the largest gain being 4.5 pounds; 6 lost, the largest loss being no less than 7 pounds.

In this may be seen an alteration to a normal relation of fat to muscle in the individual soldier under conditions of active field service as compared with conditions of garrison duty. This must be taken into consideration in appreciating the maximum losses and gains of the forty-six men of the emergency march.

It was feared that the deficiency of nitrogen in the half ration of the men in the emergency command would sap their strength by defective repair of muscular tissue, but this fear was not realized, for the daily tests with the dynamometer showed that there was no falling away in strength. In fact, the command as a whole gained in upward pull 1,079 pounds during the ten days from May 18 to May 29, an average gain of 24 pounds per man. * * * The notes of each day's pull are matter of official record, which can be furnished if desired. The pull of the men of the control experiment was increased by 32.8 pounds per man, but when the difference between 12.86 ounces and 26 ounces of water-free food per day for ten days is considered, this increase in the muscular pull of the individual must be regarded as inconsiderable.

It will be gathered from what I have submitted above that I regard the value of the emergency ration as proved, even when used to its maximum limit of ten days, not only by veteran troops, but by young and untried soldiers. On the forenoon of their return to Fort Sill, Troop E, First Cavalry, was in better training and athletic condition than when it rode out twelve days before, and as I am confident that I myself could have started out that day and repeated the ten days' experiment, so am I confident that every soldier in the troop could have done so.

As the results of this experimental expedition have proved so satisfactory, I see no reason why troops should not be accustomed to the use of the emergency ration when out from their permanent stations on practice marches and field maneuvers. The experience would be as valuable as any other experience to be gained on such occasions. It would be particularly valuable to company officers, who would have in the actual emergencies of war to look after the individual cooking and the condition of the men's haversacks from day to day. I need say nothing of the demonstrated practicability of the emergency ration from the military point of view. The advantage of having a cavalry or infantry command able to cut loose from transportation for ten days and take up an unexpected position or make an unexpected attack is self-evident; but such movements can be better effected if the men, and particularly the officers, have had some experience in carrying out their details. The desirability of sending out emergency commands during autumn maneuvers and practice field operations is therefore manifest. But under existing orders this can not be done.

General Order 49, Headquarters of the Army, Adjutant-General's Office, Washington, D. C., December 5, 1896, establishing the emergency ration, was issued under the dominance of theoretical views as to the insufficiency of this ration on half allowance. It prescribed that "the ration be resorted to only on occasions arising in active operations when the use of the regularly established ration may be impracticable," and that "although the nutritive qualities of the ration permitted its use on half allowance, it will not be so used except in cases of overruling necessity." I would therefore suggest that the said requirements be omitted from paragraph 2 of General Order 49 and that the paragraph be modified so as to read:

2. The Secretary of War directs that the emergency ration will never be used for a longer period than ten days, and that not more than five days' rations be carried on the person at one time.

Respectfully submitted.

CH. SMART,
Deputy Surgeon-General.

[First indorsement.]

WAR DEPARTMENT, SURGEON-GENERAL'S OFFICE, *September 21, 1897.*

Respectfully forwarded to the Adjutant-General of the Army.

In my opinion this is an extremely valuable report, and reflects great credit upon Lieutenant-Colonel Smart, deputy surgeon-general, whose carefully conducted experimental test shows that the emergency ration for five days may be made to serve for ten days without any injury to the health of the troops using it. I concur in the recommendation made by Lieutenant-Colonel Smart at the close of his report.

GEO. M. STERNBERG,
Surgeon-General, United States Army.

REPORT OF THE SURGEON-GENERAL.

REPORT

OF

THE SURGEON-GENERAL.

WAR DEPARTMENT, SURGEON-GENERAL'S OFFICE,
Washington, D. C., September 22, 1897.

SIR: I have the honor to submit the following report of my administration of the duties pertaining to the office of the Surgeon-General of the Army:

Among the expenditures authorized by Congress for the fiscal year ended June 30, 1897, were those for artificial limbs, for surgical appliances and for trusses for persons disabled in the line of duty, for the Army Medical Museum, for the library of the Surgeon-General's Office, for the support and treatment of destitute patients in the city of Washington, D. C., for the construction and repair of army hospitals, and for the support of the Medical Department of the Army.

ARTIFICIAL LIMBS.

During the year ended June 30, 1897, there were furnished under the laws relating to artificial limbs 301 artificial legs, 7 arms, 4 feet and 1 apparatus; and the commuted value of an artificial leg was paid in 2,856 cases of amputated leg, of an artificial arm in 2,993 cases of amputated arm, and of an artificial foot in 69 cases of amputated foot. Commutation was paid also in 3,297 cases in which the use of a limb was lost. The money expended amounted to $555,347.51, of which $552,854.46 was from the current appropriation, $2,452.35 from the appropriation for 1896, and $40.70 from that for 1895.

Artificial limbs, 1897:	
Appropriated by act approved June 11, 1896	$575,000.00
Disbursed during the year	552,854.46
Balance on hand June 30, 1897	22,145.54
Artificial limbs, 1896, act March 2, 1895:	
Balance on hand July 1, 1896	2,452.54
Disbursed during the year	2,452.35
Balance on hand June 30, 1897	.19
Artificial limbs, 1895, act August 18, 1894:	
Balance on hand July 1, 1896	2,196.71
Disbursed during the year	40.70
Transferred to surplus fund June 30, 1897	2,156.01

The number of cases paid during the year does not include the whole number that matured during that time. Cases occurring toward the end of the year have to be carried over into the next year before settlement can be effected. The following tabulation shows the cases now

on the rolls of this office and the years in which the approved claims mature:

	Due during the years ending June 30—					
	1897.		1898.		1899.	
	Cases.	Value.	Cases.	Value.	Cases.	Value.
Arms, artificial, at $50 each	3,016	$150,800	114	$5,700	62	$3,100
Legs, artificial, at $75 each	3,192	239,400	151	11,325	121	9,075
Feet, artificial, at $50 each	75	5,625	15	750	13	650
Loss of use of limb, commutation, $50	3,474	173,700	3,300	165,000	2,255	112,750
Annual total	9,757	569,525	3,580	182,775	2,451	125,575

Total cases, 15,788; value, $877,875.

The value stated is the commuted value without including the cost of transportation when the artificial limb is drawn in kind. The commuted value of the cases which matured during the past year was $569,525, to cover which and the expenditures for transportation the sum of $575,000 was appropriated by the act approved June 11, 1896. Maturing during the current fiscal year are 3,580 cases, the commuted value of which is $182,775, and for this an appropriation of $183,000 was made by the act approved July 19, 1897. There are now in the files 2,451 cases that come to maturity in the year ending June 30, 1899. These have a commuted value of $125,575, and estimates for this sum have already been submitted.

APPLIANCES.

The number of appliances issued during the year was 176, for which was disbursed the sum of $1,045.27 from the appropriation approved June 11, 1896, and $136.50 from that approved March 2, 1895, a total of $1,181.77.

TRUSSES.

There was expended in furnishing and fitting trusses to disabled soldiers under sections 1176–1178, Revised Statutes of the United States, and the act of March 3, 1879, the sum of $7,263.80. The number of trusses issued and fitted during the year was 1,043.

HOSPITAL CORPS.

During the year 70 original enlistments into the corps were made, 89 men reenlisted, 114 were transferred from the line, and 3 returned from desertion, making a total gain of 276. The losses were as follows:

Discharge for expiration of term of service	113
Discharge for disability	14
Discharge by orders	99
Discharge by general courts-martial	5
Transfer to line	13
Retirement from active service	7
Death	5
Desertion	17
Total	273

There remained in service June 30, 1897, 98 hospital stewards, 99 acting hospital stewards, and 513 privates, a total of 710.

The act of March 16, 1896, reduced the number of hospital stewards and fixed it thereafter at 100. The number is now reduced by casualty to 98.

An average of 21 men were constantly absent under the furlough

provision of the act approved June 16, 1890. Most of these men had to be replaced during their furloughs, so that the numerical strength of the corps was correspondingly increased. Of those entitled to furlough and discharge under the act cited, 69 availed themselves of the privilege. As all enlistments from August 2, 1894, were for three years, there will be no more such furloughs and discharges after August 2, 1897, so far as these enlistments are concerned, and none for the remaining five-year enlistments after November 1, 1897. The abolition of the furlough and discharge privilege will add much to the efficiency of the corps.

Four men purchased their discharge under the act allowing this procedure.

An examination of privates for detail as acting hospital stewards was held in February, 1897, by written questions sent to the posts of the applicants. Thirty-one candidates were examined, of whom 23 were successful and have been detailed and assigned.

No examination for hospital stewards has been held, as the number until lately was up to the limit allowed by law.

The hospital company of instruction at Washington Barracks and the smaller detachments in the western departments contribute materially to the training of the men in their important duties, and serve also as depots from which vacancies in the respective departments are filled. The instruction given them includes nursing, cooking, first aid to sick, litter and ambulance drill, pharmacy, assisting in operations and disinfection, taught both theoretically and practically, with field work as far as possible. The company at Washington Barracks received 46 men during the year, and from it 42 trained men were sent to other posts.

The appropriation for the support of the Corps for the fiscal year 1896–97 was $206,280. As this was more than sufficient, the appropriation for 1897–98 was reduced to $202,800.

A revised edition of the Drill Regulations for the Hospital Corps of the Army was issued during the year. The new edition was called for by changes in the equipment. The opportunity was taken to embody in it outlines of first aid for use in instructing the men of the line.

The infantry blanket bags have been done away with for members of the Hospital Corps. These bags were useless for men on mounted service and were never carried by hospital corps men on foot. When on active service, the clothing of each man is now rolled up in the shelter canvas supplied to him and is held in place by straps. It is ordinarily carried in a wagon, but can be made fast behind the saddle when the man is mounted.

The uniform of the Corps consists of three suits, a uniform for ordinary wear, a suit for ward service, and a campaign uniform.

The first (see fig. 1) consists of a dark-blue flannel blouse, lined, with five gilt buttons. The private wears on the left arm above the elbow a brassard of white cloth, 3 inches wide, with a cross of red cloth in the center. The chevrons of the acting hospital steward consist of three bars of emerald-green cloth with a red cross within, the bars one-half inch wide, separated by white silk stitching, and worn above the elbow, points down. Those of the hospital steward have, in addition, an arc of green cloth over the ends of the bars. Service chevrons are worn on both sleeves below the elbow.

The collars worn are of white linen, the cravats of black silk, the gloves of white Berlin, and the shoes of calfskin.

The cap is similar to that worn by other enlisted men of the Army—of dark blue cloth, with a visor of black patent leather rounded and sloping downward from the horizontal. The private and acting hospital

steward wear a cross of white metal on the front of the cap; the hospital steward a similar cross inclosed by a wreath of white metal.

The trousers are of light-blue kersey with stripes of emerald green, the latter being one-half inch wide for privates, 1 inch for acting hospital stewards, and 1½ inch for hospital stewards. The waist belt is of leather, black, with plate.

The equipment for service with this uniform consists of the litter sling and the hospital corps or orderly pouch.

The sack coat and trousers of the uniform for ward service (see fig. 2) are made of cotton duck, bleached for hospital stewards and acting hospital stewards, unbleached for privates.

For field service the blouse, shoes, waist belt, and trousers are the same as those of the ordinary uniform. Instead of the cap the campaign hat of drab colored felt is worn, and the lower limbs from the knee down are protected by leggings of strong cotton duck (see fig. 3). The overcoat is of sky-blue cloth, double-breasted, and with a detachable cape lined to conform in color with the facing on the uniform. The chevrons on the overcoat of the hospital steward and acting hospital steward are worn below the elbow with the point one-half inch above the cuff.

The equipment for field service consists of the litter sling, hospital corps or orderly pouch, canteen and strap, haversack and strap with meat can, tin cup, knife, fork, and spoon.

No side arms are worn, but revolvers or other available firearms may be carried when serving in the field during Indian wars, or when the rights of the hospital corps as noncombatants under the Geneva Convention will not be recognized.

MEDICAL AND HOSPITAL SUPPLIES.

The disbursements during the year ended June 30, 1897, from the appropriation made by act of Congress, approved March 16, 1896, for the expenses of the Medical Department of the Army, and from the balances of previous appropriations on hand at the beginning of the said fiscal year are presented in the following statement:

Appropriated by act approved March 16, 1896		$140,500.00
Refunded during the year		10.20
Total to be accounted for		140,510.20
Disbursed during the year:		
Medical supplies	$40,114.00	
Pay of employees	31,720.34	
Expenses at supply depots	109.70	
Medical attendance and medicines	12,426.10	
Washing at post hospitals	1,346.07	
Material for experimental cooking	250.00	
Miscellaneous expenses	126.75	
Total disbursed		86,092.96
Balance on hand to be accounted for		54,417.24
As follows:		
In United States Treasury	$27,969.99	
In hands disbursing officers:		
New York	21,917.51	
St. Louis	2,049.00	
Washington	294.61	
San Francisco	2,175.88	
Army and Navy General Hospital	10.25	
		54,417.24

Of the amount, $54,417.24, on hand July 1, 1897, about $30,000 will be required for payment of supplies contracted for and other obligations incurred prior to July 1, 1897. The balance will revert to the United States Treasury.

The approximate value of medical supplies actually issued during the fiscal year ended June 30, 1897, is $102,084.27.

Medical and Hospital Department, 1896:		
Balance on hand July 1, 1896, act February 12, 1895		$84,724.51
Refunded during the year		7.17
Total to be accounted for		84,731.68
Disbursed during the year:		
Medical supplies	$18,513.09	
Pay of employees	174.00	
Medical attendance and medicines	3,466.73	
Washing at post hospitals	207.90	
Miscellaneous expenses	25.00	
Total disbursed		22,386.72
Balance on hand to be accounted for		62,344.96
As follows:		
In United States Treasury	$53,789.61	
In hands of disbursing officers:		
New York	4,973.25	
St. Louis	875.48	
San Francisco	2,661.99	
Washington	44.63	
		62,344.96
Medical and Hospital Department, 1895:		
Balance on hand July 1, 1896, act of August 6, 1894		56,013.63
Disbursed during the year		229.70
Transferred to surplus fund		55,783.93

Recently issued medical works and improved appliances of various kinds have been supplied to the hospitals during the year. A few of the principal posts have been provided with the Roentgen ray apparatus.

To insure uniformity in the supplies furnished to post hospitals from the three medical supply depots, standard samples have been selected and distributed to the depots as the basis for future purchases. Medical supplies, especially bulky ones, are obtained at the depots nearest the posts to be supplied, thus avoiding unnecessary cost for transportation.

The therapeutic value of medicinal tablets.—During the year an investigation was made into the efficiency of those medicines that have for some time past been supplied to Army medical officers in the tablet form. The results were so far satisfactory as to show that in general the tablets do not suffer any more from deteriorating influences than other preparations of the same medicines. The intention in issuing medicinal substances in this form was to provide medical officers with known weights or doses of the various articles while economizing in the bulk of the articles and in the transportation required for medical supplies on field service. It appears, however, from the investigations made that the tablets are sometimes regarded as being pharmaceutical preparations ready for administration. In some instances this is the case, but in many others the tablet has to be prepared for use by solution in water or other menstruum, or, if insoluble, by being crushed to powder and administered in suspension or emulsion. Tablets, for instance, of bromides, iodides, chlorates, and other salts would be highly irritant to the gastric mucous membrane if swallowed without previous solution and dilution. Tablets of more or less insoluble substances such

as quinine, phenacetin, salol, and sulphonal would be slow to act, or even inert, unless crushed to a fine powder or otherwise specially treated before administration.

Reports on this subject were made by Capts. W. L. Kneedler, San Diego Barracks, Cal.; J. L. Phillips, Fort Walla Walla, Wash.; W. J. Wakeman, Fort Huachuca, Ariz., and Dr. William M. Mew, of the chemical laboratory of this office. The accuracy of the specified weights of the tablets was established by all these investigators. Any loss of weight was due to evident breakage or attrition, except in the case of such as contained chloral or camphor, the former of which evaporated and the latter condensed on the inside of the bottle. The physiological action of the tablets was tested with the utmost care and thoroughness by Dr. Kneedler on himself and others, the majority of the tests being made on himself, partly in the absence of other available subjects and partly that the effects might be observed with accuracy. This officer, after testing the stock from the Army Medical Supply Depot, purchased for comparative trials from two of the most reliable firms in the country a line of tablets of recent and improved manufacture, and in a second paper reported his results. These were satisfactory as showing rapid solution or disintegration in all cases. Dr. Mew's tests were made in the chemical laboratory. The method by which the other reporters determined the therapeutic value is not specified. The following tabulation shows the results of the examination:

Drug.	Effect.			
	Kneedler.	Phillips.	Wakeman.	Mew.
Acetanilid	Excellent	Good	Effective	
Acid, arsenosum	do	do		Good.
Acid, boricum	do	do		Do.
Aconiti tinct	Very good	do		Do.
Aloin pil. comp	Excellent	do		
Alumen	do	do	Effective	Do.
Ammonii chlorid	do	do		Do.
Antipyrin	do	do	Effective	
Apomorph. hydrochl	do			Doubtful.
Atropinæ sulph	do			Good.
Do	do			Do.
Antiseptic	do	Good	Effective	
Acid, tannicum	do			
Bismuth, subnitras	Indifferent		Effective	
Calleina	Very good			
Cannabis indica	Nil			Doubtful.
Capsicum	Excellent	Good	Effective	Good.
Chloral	Very good		do	
Copaibæ pil. comp	Nil	Good		
Cocainæ hydrochlor	Excellent			Do.
Coninæ hydrobrom	Nil			Do.
Cupri arsenis	Good	Good		Do.
Digitalinum	Excellent			
Digitalis tinct	Nil	Good	Effective	Do.
Ergotinum	Indifferent	Doubtful	do	Doubtful.
Ferri. pil. comp	Excellent	Very good		
Glycyrrh. mist. comp	do	Good	Effective	Good.
Hydrarg. chlor. mit. cum sodii bicarb	do	do	do	Do.
Hydrarg. iodid. flav	do	do		Do.
Hydrarg. massa	do	do		
Hyoscinæ hydrobrom	do			Do.
Hyoscyami pil. comp	Very good			
Ipecac	Excellent			
Ipecac. et opii pulv	do	Good	Effective	Do.
Liniment. rubefaciens	Very good	do	do	Do.
Morphinæ sulph	Excellent	do	do	Do.
Do	do			Do.
Nitro glycerinum				Do.
Oleum tiglii	Very good			Do.
Opii pil	do	Uncertain		Do.
Opii tinct. camph	Excellent	Good	Effective	Do.
Phenacetinum	Very good	do	do	
Physostigmatis tinct	Nil			Doubtful.
Physostigmatis sulph	Excellent			Good.
Pil. camph. et opii	do			Do.

Drug.	Effect.			
	Kneedler.	Phillips.	Wakeman.	Mew.
Pil. carminativæ	Excellent		Effective	Good.
Pil. cathartic comp	do			Do.
Plumbi acetas	do	Good		Do.
Physostigminæ sulph	do			Do.
Podophyllin resin	do	Good	Effective	Do.
Potassii bromidum	do		do	
Potassii chloras	do	Good	do	Do.
Potassii iodidum	do	do	do	Do.
Quininæ sulph	Indifferent	Fair	do	Do.
Quininæ hydrochloras				Do.
Salol	Nil	Good	Effective	Do.
Santoninum	Indifferent	do		Do.
Sodii bicarb	Excellent			Do.
Sodii bicarb. et menth. pip	do	Good		Do.
Sodii salicylas	do	do	Effective	Do.
Strychninæ sulph	do	do	do	Do.
Sulphonal	Nil	do	do	Do.
Zinci sulph	Excellent			Do.

[Extract from Dr. Kneedler's second report, March 12. 1897.]

As was stated in my previous report, I took four tablets of apomorphine by the mouth at one time without any appreciable effect. I injected two tablets at one time hypodermically. From the latter dose moderate emesis resulted. Several times doses of two and three tablets by the mouth failed to cause even nausea. Of the tablets purchased a dose of 0.006 has in three instances caused prompt and active emesis. One of the cases was that of a Christian scientist of some prominence in this community. Desiring to emphasize his assertion that strong faith would prevent the action of any emetic, and under promise of a convert to his belief if the medicine failed to act, he received 0.006 of apomorphine hypodermically. After violent and prolonged vomiting he stated that "the conditions for the test of faith were not favorable." I have twice taken one-tablet doses of this preparation of apomorphine. Each dose was effective.

Repeated tests of tablets of bismuth subnit. showed that because of their slow disintegration the therapeutic effects were "indifferent." Of the tablets purchased disintegration took place in ten seconds. They gave a prompt and satisfactory therapeutic effect.

The therapeutic effect of the tablets of cannabis indica was given as "nil," because 220 tablets taken within five hours failed to produce any appreciable effect. The tablets were readily soluble, but they were inert. The want of uniformity in the preparations of Indian hemp is well known. Of the tablets purchased a dose of 30 tablets, repeated in two hours produced the marked physiological action of the drug. The same effect was produced by 60 tablets, taken in 20-tablet doses at an hour apart.

Previous experiments show that tablets of copaiba comp. were particularly insoluble in water, and that when administered internally they passed unchanged through the alimentary canal. The tablets purchased disintegrated in one minute, and the prompt action of the drug is thus assured. The tabular statement of solubility shows that these tablets grow less soluble with age.

While testing tablets of coniinæ bromohyd. I took large and repeated doses, both hypodermically and by the mouth, without being able to detect a single evidence of the action of the drug. Of the tablets, issue of 1897, a two-tablet dose, taken hypodermically, produced in one hour a fall of 15 beats in the pulse, a heavy feeling of the eyelids, a marked lassitude, and numbness of the lower extremities. This headache could be traced to nothing but the action of the drug. Three tablets taken at one time by the mouth produced the same symptoms, but in a less degree.

The experiments with tablets of tincture of digitalis that I have been able to make have been upon myself and others in perfect health. The tablets, taken 4 at a dose, repeated every hour until four doses had been taken, cause some slowing and strengthing of the heart beat and an apparent increase in the flow of the urine. While these effects of the drug have not been especially marked, I am of the opinion that they indicate a good quality of the tablets, as it is only upon diseased structures that digitalis has its full effect.

The therapeutic effects of tablets of ergotin and santonin were given in my previous report as "indifferent." I was unable to secure satisfactory results from the use of tablets of these drugs. Their variability, so far as power is concerned, is very great—so great as to make them unreliable.

My previous report gave negative results from the use of 40 tablets of physostigma,

taken within one and a half hours, and of 85 tablets, taken within ten hours. Absolutely no effect was produced by the use of this drug. The tablets of physostigma that were purchased have been satisfactory. A dose of 30 tablets, followed in two and a half hours by a dose of 35 tablets, produced the physiological action of the drug. Some headache and almost absolute insomnia, for one night, resulted from the above doses of physostigma.

The therapeutic action of quinine tablets was previously reported as "indifferent," because it was found that tablets from the same bottle varied in time of disintegration from twelve minutes to seven hours. It was believed that in fevers the tablets of slow disintegration would pass from the bowel wholly or in part unabsorbed. The tablets purchased were of quinine bisulph., 0.13 each. These tablets disintegrate in from ten to twenty seconds, are practically unaffected by changes of temperature and of humidity, and do not break or wear when subjected to continued transportation. Such tablets of so important a drug as quinine are a very valuable addition to the pharmacopœia.

The unfavorable report, previously made, of the therapeutic effect of tablets of salol and sulfonal was because of the fact that tablets of these drugs had been found in the stools some hours after they had been administered by the mouth. Of the issue of 1897, the tablets of both of these drugs have been in water for sixteen days without even a suspicion of solution or disintegration. Under the same conditions, tablets of sulfonal that I purchased disintegrated in fifty-five minutes, and of salol in fifty seconds. I am of the opinion that such tablets give the full effect of the drugs.

It is not the intention of this report to criticise in the slightest manner, the quality of the tablets furnished for the use of the medical department. I simply give facts, or what, after five months' study, seem to me to be facts in regard to the tablets with which I have had to deal. Through my ignorance of the nature of tablets I can recall many cases of injustice to my patients, and some of actual malpractice. Both in the garrison and in the field the utility of the tablet will be increased when it is generally understood and constantly remembered that the purpose of the tablet is to represent an accurate quantity of a given drug, put up in the tablet form for increased safety in dosage and for greater convenience in dispensing.

There is no question but that ignorance of the true nature and purpose of the tablet leads to administration of drugs in the tablet form when such administration is hurtful alike to the welfare of the patient and the reputation of the practitioner. If attention were called to this matter the conscientious practitioner would seek a knowledge of the nature of tablets, and this knowledge would prevent the blunders that are now made.

Drugs, of which potassium bromide may be taken as a type, would not be daily given in the form of tablets, when it was known how slow of disintegration such tablets often are, and how very irritating is their effect upon the delicate mucous membrane of the alimentary canal.

The discomforts of acute indigestion would not be temporarily aggravated by tablets of bicarbonate of soda, soda mint, and carminatives, when tests of the solubility of these tablets had been made, and it was fully understood how slow, if any, must be the effects of such tablets, unless they were dissolved or powdered before administration.

A prompt and uniform result would not be anticipated when tablets of quinine sulph. were given, if it were known that such tablets, taken from the same bottle, require from minutes to hours for disintegration.

Little but moral effect would be expected from the use of tablets of sulfonal, if such tablets were of the variety that experiment has shown capable of passing unchanged through the alimentary canal.

No medical officer would burden his sick report with cases of gonorrhea while treating the disease with compound tablets of copaiba, if he had found such tablets unchanged in the stools a few hours after they had been administered by the mouth.

The indications for a prompt and reliable remedy are marked in such a disease as acute articular rheumatism. Salol, in tablet form, would seem to be a prescription above criticism for such a case. As has been said, repeated experiments in this hospital showed that the tablets of salol on hand were insoluble in the fluids of the intestines. Finding the tablets in the passages from the bowels was only a matter of interest, as the tablets were taken by those in perfect health. There would be less opportunity for solution, when, from disease, the mucous membrane of the stomach and intestines was irritable; and if the case were a serious one where prompt treatment was required, the result might be disastrous.

Investigation would seem to indicate that tablets capable of rapid disintegration can be manufactured of the majority of drugs. Some of these tablets grow more, and some less, soluble with age and with exposure to the atmosphere. They bear changes of temperature and humidity well, and are capable of continued transportation, without breakage, and with little loss of weight from attrition. Such ideal

tablets can be manufactured, but, until the tablets are tested to determine their qualities, it would not be well to regard the supply on hand as of the ideal type. Until opportunity offers for such tests, if prompt and reliable effect is desired, and tablets are used, it would be well to administer them in the form of powder or solution. Such course would be followed by every practitioner, who, knowing the defects to which tablets are liable, hesitated to administer his remedies in any but such form as would most improve his patient's physical condition, and best advance his own professional reputation.

[Extract from Dr. Mew's report, September 3, 1897.]

It will be seen that Captain Kneedler in his first paper reported upon the therapeutic effect of 61 samples, against 11 of which the word "indifferent" or "nill" is placed. It may be here remarked that not less than six of these are so marked, not because of inherent inefficiency of the tabellated drug, but because they were exhibited in accordance with what Captain Kneedler has, in his later report, described as "a vicious custom." Captain Phillips reported upon the effect of 36 samples against which, in all but two cases, the word "good" is placed. Captain Wakeman reported on the effect of 26 samples, all of which are marked effective.

I report upon 46 samples, of which four are marked "doubtful." Eliminating those in Captain Kneedler's report, which could without the least difficulty have been made effective, we have from his investigation 56 out of 61, or nearly 92 per cent of efficient samples; from Captain Phillips's investigations, 94.4 per cent; from Captain Wakeman's investigation, 100 per cent, and from my laboratory tests, 91 per cent. The mean of these percentages is, in round numbers, 94 per cent.

Basing my opinion upon frequent examination of old fluid extracts and tinctures during the last quarter of a century, I feel warranted in stating that the advantage in permanence of efficiency is on the side of the tablets.

The tablets included in my tests were probably from three to five years old. Of these only the following were found to be in a condition which would not warrant their acceptance as bid samples prior to a purchase: Apomorphine hydrochlorate, a notoriously unstable salt, which had undergone a change, not well understood but supposed to be one of oxidation; eserine tablets, which, while chemically perfect, had run together in the containing tube and could not be separated for use; the cannabis indica tincture, also an unstable drug which had evidently deteriorated, and the ergotine, which was of doubtful value.

The discussion of this subject has been enriched by a second report by Captain Kneedler, of March 12 last, marked by evidence of that care and thoroughness which was a feature of his earlier report.

Accepting the results of his previous investigation, so far as they relate to the integrity of the drug included in the tablet mass, as favorable in all but a few instances, the present paper is designed to establish the proposition that, in certain specified instances, the failure to secure physiological effect was attributable to the insolubility of the tablet, or if not normally soluble in water, to its failure to disintegrate rapidly, thus resulting in its passage through the alimentary canal; that *cæteris paribus*, the rapidity of disintegration of insoluble drugs, is a fair measure of their probable therapeutic value. To this proposition there is not much room for dissent if it can be safely assumed that the exhibition of whole tablets is the better way. But it is very doubtful if such an assumption could find acceptance with any experienced physician. Captain Kneedler pertinently refers to it, as I have above remarked, as "a vicious custom." The exhibition of the salts of the halogens in any other than a state of solution may very properly be so regarded, and the same is true of the salts of quinine. Other substances, the salts of bismuth, for instance, are much more easily and effectively exhibited in suspension than in any other way, while salol, sulfonal, and other more or less insoluble drugs can with equal ease be made to do good service in emulsion or in suspension. Tinctures or extracts can be removed from the tablet mass in solution by means of a little alcohol. Had Captain Kneedler reduced his quinine tablet to powder, added water to it, and then stirred it with a rod moistened with a suitable acid, sulphuric or hydrochloric, for example, he would in a couple of minutes have secured its solution and with it its efficiency. By such means prompt therapeusis can be assured in cases where in a stomach loaded with catarrhal mucus, whole tablets of powdered drugs may be reasonably expected to become entangled and hence inoperative. As a matter of fact, this often occurs, thanks to the revelations of the stomach tube, by means of which I have found pills, capsules, powders, and food protected by catarrhal mucus from solution, disintegration, and absorption, hours after their ingestion. By such means and under such circumstances the question of therapeutic value ceases to be dominated by the consistency of the tablet mass.

The foregoing remarks are intended to point out in a general way what, in my judgment, are the surest methods of securing complete therapeusis in such pathological states as may demand prompt action. But it must be admitted that there

are circumstances under which it would be impracticable to apply them. They could not be applied in field service, for example, and it is on such service that a rapidly soluble or an easily disintegrating tablet may be of great value. It must also be admitted that Captain Kneedler has proved by his carefully and thoroughly conducted experiments that such tablets *can* be made, thus securing much greater facility in manipulation and preparation for use. It remains, however, to be proved that these clearly demonstrated advantages are not attained at a sacrifice of the integrity, after a few weeks or months of storage, of some of the more unstable preparations, the mydriatic and some other alkaloids, for example.

There is one other matter connected with this subject to which I beg to call your attention. Many firms have adopted the practice of making their galenical preparations of a definite strength, determined by assay, and I see no reason why such methods may not be extended to the tablet form of medication. It would, it appears to me, be a decided advantage in every way.

From a consideration of the experiments recorded in these papers the following conclusions, briefly summarized, may, in my judgment, be safely drawn:

That the tablet furnishes the most convenient mode of transporting and storing and measuring medicines for army use.

That the therapeutic effects of drugs supplied in tablet form are, to say the least, as well preserved as they are by any other means.

That a widespread misconception of the functions and proper use of the tablet has led to an unwarranted distrust of the therapeutic efficiency of some tablets supplied by the Medical Department of the Army to army posts.

That experience has proved what a priori considerations should have made clear—that to secure prompt and salutary results, it is desirable that before administering medicines so prepared they should be dissolved or suspended in a suitable medium.

That properly used, the question of the consistency of the tablet mass is not one of vital importance, but there can be no doubt that for convenience in manipulation, tablets, such as those experimented upon by Captain Kneedler and reported upon in his latest report would be a decided improvement upon those now in use, provided it can be proved that convenience is not gained by a sacrifice of the integrity of the drug.

That this question is of sufficient importance to warrant a trial of samples of such tablets by testing them in the laboratory when freshly made and at intervals during a year thereafter.

That if tests conducted in that way prove that the integrity of the drug is not impaired, it would be wise in advertising for bids to insert a clause in the circular making rapid solution or disintegration a requirement.

That there appears to be no limit to the availability of the tablet as a means of medication.

That the deterioration found in the tablets examined in the laboratory was not greater than would have occurred in any other form of preparation.

That more frequent purchases of apomorphine, cannabis indica, Calabar bean, and cocaine hydrochlorate are desirable.

That it would also be an advantage to endeavor to secure tablets prepared from tinctures or extracts of definite strength, alkaloidal or other, to be determined by analysis.

HOSPITALS AT MILITARY POSTS.

Great improvement has been made during the past few years in the hospital accommodations at many of our military posts. At the present time new hospitals are in progress of construction at five posts: Forts Hamilton and Wadsworth, N. Y., Fort Hancock, N. J., Fort Monroe, Va., and Fort Spokane, Wash. In 1896 a hospital was completed at Fort Logan H. Roots, Ark. In 1895 new hospitals were erected at Fort Myer, Va., Fort McHenry, Md., Plattsburg Barracks, N. Y., Fort Meade, S. Dak., and Fort Harrison, Mont., and in 1894 at Washington Barracks, D. C.

These hospitals are of brick with a 2-inch air space in the exterior walls and no furring on the inside; the plaster is applied direct to the brickwork and has a soapstone finish. Pressed steel ceilings are used on each floor above the basement. Each building is heated by hot water and ventilated through galvanized iron ducts and brick flues by direct-indirect radiation. The basement is concreted, well ventilated, and usually contains a boiler room, coal room, several storerooms, a

vegetable cellar, and a large room under the ward wing, which is used as a drill room for the detachment of the hospital corps in bad weather.

The hospitals are for 12, 24, or 36 beds, according to the size of the post. The building at Plattsburg Barracks, N. Y., fig. 4, is two stories high with a mansard roof. It has accommodation for 36 patients.

PROVIDENCE HOSPITAL.

The act of Congress approved June 11, 1896, appropriated $19,000 for the support and medical treatment of destitute patients in the city of Washington, D. C., under a contract to be made with the Providence Hospital by the Surgeon-General of the Army. The amount of relief afforded under this appropriation was as follows:

Patients in hospital July 1, 1896	105
Admitted during the year	1,214
Total number treated	1,319
Average number admitted per month	109
Number remaining in hospital June 30, 1897	118
Total number days treatment afforded	41,292
Average number of days treatment per patient	31
Average number of patients treated per day	113
Longest term of treatment (days)	365
Shortest term of treatment (days)	1
Number of patients in hospital during the whole year	30

ARMY AND NAVY GENERAL HOSPITAL, HOT SPRINGS, ARK.

The capacity of the hospital is 15 beds for officers and 64 for enlisted men. Four of the beds for enlisted men are occupied by the nurses in the wards, and the remaining 60 is the maximum number available under ordinary sanitary conditions.

Including 3 officers remaining in hospital December 31, 1895, the whole number treated during the calendar year 1896, was 25, of whom 19 belonged to the active list of the Army. Five of these officers remained under treatment December 31, 1896; 1 died and 19 were returned to duty or left the hospital very much improved after an average treatment of about sixty-nine days. The maximum number under treatment at one time was 11, the minimum 1.

During the year 84 enlisted men of the Army were regularly transferred to the hospital for treatment. Sixteen of these were from the cavalry, 7 from the artillery, 52 from the infantry, and 9 from other corps. They were received from 47 stations; the largest number from any one station was 9. The Department of the East sent 18; the Missouri, 10; Dakota, 8; the Platte, 16; Texas, 9; Colorado, 14; California, 5, and the Columbia, 4. These admissions were distributed as to disease: Rheumatism in its various forms, 53; diseases of the skin, 4; diseases of the nervous system, 10; diseases of the digestive system, 5; disease of the heart, 2; disabilities from injuries, 4, and other disabilities, 6. In addition to these enlisted men regularly transferred there were received into hospital 2 enlisted men of the Army on furlough and sick in Hot Springs, 1 man from the Navy, and 1 from the Marine Corps. These, with 18 men remaining from the previous year, make a total of 106 men treated during the year. Of this number, 30 remained on sick report December 31, 1896, 56 had been returned to duty, 15 discharged on certificate of disability, 1 had died, and 4 had been discharged or transferred. The average duration of the 76 completed cases was eighty-nine days at their station and one hundred and twenty-one days

in this hospital. Reports received from the surgeons of the various posts six months after the 56 men had been returned to duty show that 39 were doing full duty with their companies, 5 had been discharged on expiration of term of service but were in good health at the time of their discharge, 2 had deserted, and 10 had been discharged on account of a recurrence of their disease.

Almost every case sent to this hospital is a case for discharge on certificate of disability at a post. All the benefits to be derived from treatment there have been unavailing, and but for the special facilities afforded for treating such cases at the Hot Springs, many men who are now returned to duty would become pensioners of the Government for years.

On my recommendation, in May last the President directed the amendment of the regulations governing admission to this hospital so as to admit to its benefits honorably discharged soldiers and sailors of the Regular and Volunteer Army and Navy of the United States when there are vacant beds in the hospital for their occupancy. Circular No. 1, May 8, 1897, from this office, published full information for the guidance of applicants for admission. Since then 12 individuals belonging to the classes mentioned have taken advantage of the privilege. When the authority for their admission for treatment becomes generally known, there is no doubt that many veterans of the war disabled by rheumatism and other diseases which the waters of the Hot Springs have an established reputation in benefiting will become applicants for admission. The circular cited above reads as follows:

[Circular No. 1.]

WAR DEPARTMENT, SURGEON-GENERAL'S OFFICE,
Washington, D. C., May 8, 1897.

By direction of the Secretary of War the following information is published for the guidance of applicants desiring admission to the Army and Navy General Hospital, Hot Springs, Ark.

The hospital is under the direction of the Secretary of War, and is devoted to the treatment of officers and enlisted men of the military and naval service of the United States, officers of the Revenue-Cutter Service and of the Marine-Hospital Service, and honorably discharged soldiers and sailors of the Regular and Volunteer Army and Navy of the United States for such diseases as the waters of the Hot Springs of Arkansas have an established reputation in benefiting, except that cases of venereal disease will not be admitted.

Admission to this hospital is restricted to those of the above-named classes who require medical treatment in the following order of preference: (1) Officers and enlisted men of the Army, the Navy and the Marine Corps on the active lists, and cadets at the Military and Naval Academies; (2) officers and enlisted men of the Army, the Navy and the Marine Corps on the retired lists; (3) officers of the Revenue-Cutter Service and of the Marine-Hospital Service; (4) honorably discharged soldiers and sailors of the Regular and Volunteer Army and Navy of the United States may also be admitted by authority of the Surgeon-General when there are vacant beds in the hospital.

Authority for the admission of an officer of the Army on the active list will be granted on his personal application, through the regular military channels to the Adjutant-General of the Army, for a sick leave of absence, based upon a medical officer's certificate specifying the disability for which treatment at this hospital is recommended. Retired officers of the Army may make direct application, accompanied by a medical certificate, to the Adjutant-General for permission to enter the hospital. Officers and enlisted men of the Navy are admitted under regulations prescribed by the Secretary of the Navy. Officers of the Revenue-Cutter Service and Marine-Hospital Service are admitted on the request of the Secretary of the Treasury to the Secretary of War, and upon approval of the Surgeon-General of the Army.

Officers under treatment, when subsisted in the hospital, will be subject to a charge for subsistence not to exceed $1.50 per day. Military and naval cadets are required to pay a subsistence charge of $1 per day.

For the admission of an enlisted man of the Army, application should be made by the immediate commanding officer to the department commander on the recommendation of the surgeon, which will accompany the application. Should the chief surgeon so advise, the department commander may order the soldier to report to the commanding officer of the hospital for admission for treatment.

Honorably discharged soldiers and sailors of the Regular and Volunteer Army and Navy of the United States are admitted upon the approval of the Surgeon-General of the Army, from whom blank forms of application can be obtained. These must be properly filled up, giving all necessary information in relation to the applicant, and should be certified to by a practicing physician, who will state the nature of the disability and the probable period required for hospital treatment. Patients admitted under this authority may be discharged from the hospital by the commanding officer at any time he may deem proper. Expenses to and from the hospital must be defrayed by the applicant.

Enlisted men on the active list while under treatment or on duty in the hospital will have the usual allowance of rations commuted at the rate of not less than 30 cents per day. Enlisted men of the Army, the Navy, and the Marine Corps on the retired list and honorably discharged soldiers and sailors of the Regular and Volunteer Army and Navy of the United States will pay for subsistence 30 cents per day.

In certifying cases for admission to this hospital medical officers and physicians should recommend only those that are serious or obstinate and in which there is a reasonable probability that the facilities there afforded will materially aid in the rapidity and permanence of recovery.

Patients reach the hospital from the west, north, and east most conveniently by way of St. Louis, over the Iron Mountain Road to Malvern, 25 miles from Hot Springs, thence by rail. By leaving St. Louis at night patients arrive at a convenient hour next day. Those from the south should go by way of Memphis, Little Rock, and Malvern.

Relief may reasonably be expected at the Hot Springs in the following conditions: In the various forms of gout and rheumatism, after the acute or inflammatory stage; neuralgia, especially when depending upon gout, rheumatism, metallic or malarial poisoning; paralysis, not of organic origin; the earlier stages of locomotor ataxia; chronic Bright's disease (the early stages only), and other diseases of the urinary organs; functional diseases of the liver; gastric dyspepsia, not of organic origin; chronic diarrhea; catarrhal affections of the digestive and respiratory tracts; chronic skin diseases, especially the squamous varieties, and chronic conditions due to malarial infection.

GEO. M. STERNBERG,
Surgeon-General United States Army.

Approved:
R. A. ALGER,
Secretary of War.

ARMY MEDICAL MUSEUM.

The amount expended during the year on behalf of the Army Medical Museum is shown in the following statement:

Appropriated by act approved March 16, 1896	$5,000.00
Disbursed during the year	4,882.76
Balance on hand June 30, 1897	117.24
Army Medical Museum, 1896, act of February 12, 1895:	
Balance on hand July 1, 1896	439.39
Disbursed during the year	438.92
Balance on hand June 30, 1897	.47
Army Medical Museum, 1895, act of August 6, 1894:	
Balance on hand July 1, 1896	38.58
Transferred to surplus fund June 30, 1897	38.58

The total number of specimens in the Army Medical Museum at the end of the fiscal year, June 30, 1897, was 36,897. The following statement shows in detail the additions and changes in the different sections:

Pathological section:		
In museum June 30, 1896		11,021
Discarded		1
		11,020
Transferred from anatomical section	1	
Transferred from provisional pathological section	1	
Transferred from provisional anatomical section	1	
		3
Received during the year		239
In museum June 30, 1897		11,262
Anatomical section:		
In museum June 30, 1896		3,645
Transferred to pathological section	1	
Transferred to provisional anatomical section	1	
		2
		3,643
Received during the year		67
In museum June 30, 1897		3,710
Section of comparative anatomy:		
In museum June 30, 1896		1,689
In museum June 30, 1897		1,689
Microscopical section:		
In museum June 30, 1896		12,360
Added during the year		390
In museum June 30, 1897		12,750
Miscellaneous section:		
In museum June 30, 1896		2,270
Received during the year		94
In museum June 30, 1897		2,364
Provisional pathological section:		
In museum June 30, 1896		1,923
Discarded during the year	2	
Transferred to pathological section	1	
		3
		1,920
Received during the year		73
In museum June 30, 1897		1,993
Provisional anatomical section:		
In museum June 30, 1896		838
Discarded	2	
Transferred to pathological section	1	
		3
		835
Transferred from anatomical section		1
Received during the year		55
In museum June 30, 1897		891
Photographic series:		
In museum June 30, 1897		2,238

RECAPITULATION.

Specimens in museum June 30, 1897	33,746
Discarded	5
	33,741
Added	3,156
Specimens in museum June 30, 1897	36,897

The following are some of the more interesting specimens added to the museum collection during the fiscal year ended June 30, 1897:

1. Three specimens of malformation. One, showing union of two individuals by the head and thorax, contributed by Dr. S. L. Hannon and Mr. H. M. Crowell, Washington, D. C.; another showing encephalocele, contributed by Dr. D. H. Hazen, Washington, D. C.; a third showing extroversion of abdominal viscera together with spina bifida and absence of external genitals, contributed by Dr. A. W. Tancil, Washington, D. C. The first specimen is from the pig and the other two are human.
2. Specimens of anomalies, diseases and injuries of bone. (1) Portions of fœtal skeleton showing fœtal rickets, contributed by Dr. D. S. Lamb, pathologist, Army Medical Museum. (2) Bilateral bony anchylosis of jaw of twenty years' standing, supposed to be of rheumatic origin; death from general tuberculosis; contributed by Dr. D. S. Lamb, pathologist, Army Medical Museum. (3) Tuberculosis of hip joint with total destruction of head of femur, contributed by Dr. D. S. Lamb, pathologist, Army Medical Museum. (4) Fracture of skull, with repair; injured at 13 years, died at 62; served twenty-one years in the United States Army; showed mental weakness in the last ten years of his life; contributed by Col. W. H. Forwood, Assistant Surgeon-General, United States Army. (5) A skull showing deep cut over frontal bone, with repair. (6) Shot fracture of sixth thoracic vertebra and sixth and seventh ribs; death; contributed by Maj. L. M. Maus, surgeon, United States Army. (7) Shot fracture of tibia, with repair; the soldier died from fracture of the skull; contributed by Maj. J. B. Girard, surgeon, United States Army.
3. Series of bones from mounds in Florida and Georgia, some showing fracture with repair, others the results of inflammation believed to be syphilitic; also such anomalies as pilasterism of femur and platycnemism. Contributed by Mr. Clarence B. Moore, Philadelphia, Pa.
4. "Melon seed" bodies from synovial sheaths of hand. Contributed by Mr. W. T. W. Moritz, Washington, D. C.
5. Large pelvic sarcoma in a man 20 years old, supposed to have originated in a cryptorchism. Contributed by Dr. E. A. Balloch, Washington, D. C.
6. Three specimens of cerebral hemorrhage from colored women. One from a woman, age 49; there was an old clot in the caudate nucleus. The second from a woman, age 21, who died of general tuberculosis; the hemorrhages were cortical and the veins thrombosed. The third from a woman, age 18, who was sick twenty-four hours; the hemorrhages were large and mainly cortical and there was much acute softening. Contributed by Dr. D. S. Lamb, pathologist, Army Medical Museum.
7. Tumor and cyst of cerebellum in a man, age 45, from whom a portion of cerebellum had been excised by Dr. James Kerr, with partial relief. Contributed by Dr. J. F. Moran, Washington, D. C.
8. Neuroma from a stump of nerve of a horse. Excised and contributed by C. B. Robinson, veterinary surgeon, Washington, D. C.
9. Heart of a child, showing interventricular foramen. Contributed by Dr. G. N. Acker, Washington, D. C.
10. Ulcerative endocarditis with death from acute peritonitis. Contributed by Dr. D. S. Lamb, pathologist, Army Medical Museum.
11. Fibrous myocarditis. Contributed by Dr. J. R. Francis, Washington, D. C.
12. Arterio-venous aneurism of neck. No history of traumatism. Contributed by Dr. D. S. Lamb, pathologist, Army Medical Museum.
13. Two specimens of leucæmic spleen. One weighed 108½ ounces, removed post mortem. Contributed by Dr. B. B. Adams, Washington, D. C. The other weighed 80 ounces, and was removed by operation, but the patient died. Contributed by Dr. J. W. Bovèe, Washington, D. C.
14. Two specimens of tumor of suprarenal capsule. In one, contributed by Dr. I. S. Stone, of Washington, D. C., the tumor is a carcinoma; in the other, contributed by Dr. James Kerr, of Washington, D. C., it is a sarcoma. In each case the capsule and kidney were removed by a lumbar operation with partial relief.

15. Cheesy degeneration of bronchial glands with multiple ulceration into trachea and bronchi, followed by fatal hemorrhage, apparently from bronchial arteries; from a case of general tuberculosis. Contributed by Dr. D. S. Lamb, pathologist, Army Medical Museum.
16. Extreme sloughing of tonsil in a man, age 20, who had also vegetative endocarditis and subpleural hemorrhages. Contributed by Dr. D. S. Lamb, pathologist, Army Medical Museum.
17. Larynx, nearly filled by an irregular tumor, extirpated. Patient died. Contributed by Dr. J. Kerr, Washington, D. C.
18. Large hemorrhagic infarctions of lung with recent lymph on pleura, from a boy, age 17, who had also a large subdural hemorrhage, many subpericardial ecchymoses and ecchymosis of stomach. A case of acute infection apparently from arthritis, which was supposed to be gonorrheal. Contributed by Dr. W. K. Butler, Washington, D. C.
19. Tumor and ulceration of tongue of a horse. Contributed by C. B. Robinson, veterinary surgeon, Washington, D. C.
20. A series of anomalies of teeth; one of malposition of tooth, contributed by W. H. Brown, D. D. S., Nashville, Tenn.; one of malposition of tooth and one of supernumerary teeth, contributed by M. F. Finley, D. D. S., Washington, D. C.; two of supernumerary teeth and a set of plaster casts showing correction of prognathism by appliances, contributed by Williams Donally, D. D. S., Washington, D. C.; one of transposition of teeth, contributed by J. Searle Hurlbert, Springfield, Mass.; two of malposition of teeth with corrective appliances, contributed by V. H. Jackson, D. D. S., New York, N. Y.; one of malposition of tooth, contributed by E. C. Sloan, D. D. S., Ironton, Ohio.
21. Cancer of stomach and greater omentum in a woman, aged 20. Contributed by Dr. D. S. Lamb, pathologist, Army Medical Museum.
22. Inflamed vermiform appendix, from a soldier, removed by operation; recovery. Contributed by Col. W. H. Forwood, Assistant Surgeon-General, United States Army.
23. Large portion of omentum from inguinal hernia which was strangulated. Contributed by Col. W. H. Forwood, Assistant Surgeon-General, United States Army.
24. Extreme atrophy of kidney from a soldier, age 60, who had general arteriosclerosis, cerebral softening, hypertrophy of heart with mitral insufficiency and congestion and infarction of lungs. Contributed by Col. W. H. Forwood, Assistant Surgeon-General, United States Army.
25. Kidney with abscess cavities and calculus, from a woman, age 21. Removed and contributed by Asst. Surg. E. B. Frick, United States Army.
26. Portion of penis showing unusual exaggeration of papillæ on the corona; from a negro. Contributed by Dr. D. S. Lamb, pathologist, Army Medical Museum.
27. Testicles removed on account of prostatic hypertrophy; behind one testis is a large granular mass, apparently inspissated pus. Removed and contributed by Dr. A. A. Snyder, Washington, D. C. Recovery with relief.
28. Labia majora enlarged by myxo-fibroma. Removed and contributed by Dr. J. W. Bovée, Washington, D. C. Recovery.
29. Pus tubes from a colored woman, age 47. Removed and contributed by Capt. A. E. Bradley, assistant surgeon, United States Army. The patient died.
30. Hemorrhage into ovary and fallopian tubes. Removed and contributed by Dr. J. W. Bovée, Washington, D. C. Recovery.
31. Large cyst of ovary, from a mulatto woman. Removed and contributed by Dr. D. H. Williams, surgeon in chief, Freedmen's Hospital, Washington, D. C.
32. Series of 26 preparations made by J. Baretta, of Hospital St. Louis, Paris, showing the following lesions: Three showing lupus of tongue, face, and anal region; five tuberculosis of buttock, of penis, of finger, of leg, and foot; one suppuration of skin from iodide of potassium; one ordinary suppuration of skin; one suppuration of skin, with cicatrices from injection of morphia; one gumma of leg; one suppurating lymphoma of face; one keloid of thorax; one sarcoma of buttock; one angioma of foot; one syphilis of tongue; one psoriasis of vulva; one herpes of foot; one ichthyosis of thigh; one papular inflammation of buttocks due to pederasty; one varicose veins of hand; one hydroa of hand; one acanthosis of neck, shoulder, etc., and one of pseudo-xanthoma of arm.
33. A series of 12 wax models showing the development of the human heart, made by F. Ziegler, of Freiburg, Germany, after preparations of Prof. W. His.
34. A series of 8 models showing the development of the human brain, made by F. Ziegler, of Freiburg.
35. A series of 16 dissected and injected specimens of mammals, birds, reptiles, etc., showing their internal organs in position.

36. A series of 7 nerve preparations showing the system of nerves in vertebrates and invertebrates.
37. A series of 32 instantaneous photographs representing anatomical movements in certain abnormal conditions of the human body and of normal anatomical movements in the drill of the soldier.

LIBRARY OF THE SURGEON-GENERAL'S OFFICE.

The amount expended during the year on behalf of the library was as follows:

Appropriated by act approved March 16, 1896	$10,000.00
Disbursed during the year	10,000.00
Library Surgeon-General's Office, act February 12, 1895:	
Balance on hand July 1, 1896	802.22
Disbursed during the year	791.12
Balance on hand June 30, 1897	11.10

The additions made to the library during the fiscal year are shown below:

Description.	On hand June 30, 1896.	Added during fiscal year.	Total June 30, 1897.
	Volumes.	*Volumes.*	*Volumes.*
Medical journals	35,396	1,151	36,547
Medical transactions	5,269	237	5,506
Bound theses	1,829	70	1,899
Bound pamphlets	2,614	31	2,645
Other medical books	75,236	2,091	77,327
Total	120,344	3,580	123,924
Medical theses	a57,872	2,328	59,140
Medical pamphlets	141,728	9,284	151,012
Total	199,600	11,612	210,152

a Of the total number of theses on hand June 30, 1896, there were 1,060 bound in 70 volumes during the year.

There were presented to the library during the year 457 books and 6,467 pamphlets and journals.

Volume II, second series, of the Index Catalogue includes the letter "B" and forms a volume of 954 pages. It will be ready for distribution at the usual time. The appropriation for Volume III, second series, having been made, the manuscript is in course of preparation for the printer.

MEDICAL OFFICERS.

There were 108 medical officers reported to this office as having been on duty with scouting parties and on other field service during the year.

Deaths.—Two surgeons with the rank of major.

Retirements.—On request, after thirty years' service, 1 assistant surgeon-general with the rank of colonel; 1 surgeon with the rank of major. For disability, 2 assistant surgeons with the rank of captain. By operation of law, 1 assistant surgeon-general with the rank of colonel; 1 surgeon with the rank of major.

Promotions.—Two deputy surgeons-general with the rank of lieutenant colonel to be assistant surgeons-general with the rank of colonel; 2 surgeons with the rank of major to be deputy surgeons-general with the rank of lieutenant-colonel; 6 assistant surgeons with the rank of captain to be surgeons with the rank of major; 11 assistant surgeons

with the rank of first lieutenant to be assistant surgeons with the rank of captain.

Appointments.—Eight assistant surgeons with the rank of first lieutenant. These were selected by a board convened in Washington, D. C., September 23, 1896. Forty-seven candidates were invited to appear before the board; 6 failed to appear; 12 were rejected for physical disability; 14 were found disqualified professionally; 3 were rejected at preliminary examination; 4 withdrew after partial examination; 8 were found qualified and were recommended for appointment.

Vacancies.—There are now (June 30, 1897) five vacancies in the Medical Department.

THE ARMY MEDICAL SCHOOL.

The report of the president of the Army Medical School on the work of the past year shows the earnest endeavors of the members of the faculty to make the course of study one of the best of its kind with the facilities at command. The practical instruction in operative surgery is a valuable preparation for the responsibilities of service in the Army, where the surgeon has frequently to act for himself in cases which in civil life would be treated only after professional consultation. The laboratory work in bacteriology and sanitary chemistry is also of great importance. The teachers of these branches have reported, as the result of their experience during the past three sessions, that a course of four months does not give them time to deal with their subjects in a thorough and satisfactory manner. To enable them to do this General Orders 43, War Department, Adjutant-General's Office, Washington, D. C., July 6, 1897, extended the course of instruction from four to five months, the session beginning as heretofore on the first Monday of November.

The student officers during the past year are credited with having pursued the course with an interest which gave great satisfaction to the faculty. Nevertheless it appears to me that better results would be obtained if the class standing of the students at the end of the session were to have weight in determining their relative rank. The work of a student, whether good or bad during the course of instruction, has no effect upon his relative rank, which is at present determined by competitive examination before entering the school. The passage of an act of Congress giving weight to the course of instruction in determining the lineal rank of officers appointed on the same date would be of much benefit to the school and to the Medical Department of the Army.

REPORT OF PRESIDENT OF ARMY MEDICAL SCHOOL.

ARMY MEDICAL SCHOOL,
Washington, D. C., March 25, 1897.

To the SURGEON-GENERAL OF THE ARMY.

SIR: I have the honor, as required by General Orders 78, Headquarters of the Army, September 22, 1893, to submit the following detailed report of the condition of the Army Medical School, of the instruction given during the session just ended, and of the relative proficiency of the pupils as determined by examinations held at the close of the course.

This the third session of the school began November 4, 1896, and ended March 12, 1897. The main courses of instruction have been given as laid down in the order establishing the school in 1893, namely, duties of medical officers, military surgery, military medicine, military hygiene, sanitary chemistry, clinical and sanitary microscopy, and Hospital Corps drill and first aid. Under authority of the War Department and direction of Colonel Sumner, commanding, instruction in riding was given at Fort Myer, Va., every Saturday morning by Lieut. H. A. White, Sixth Cavalry. A practical course in operative surgery was conducted by the professor of military surgery, as was done last year, and the student officers attended surgical clinics at Barnes Hospital, Soldiers' Home.

Auxiliary lectures have been delivered as follows: On military law, by Lieutenant-Colonel Davis, deputy judge-advocate-general; on mental diseases at the Government Hospital for the Insane, under the direction of the superintendent, by Dr. George W. Foster, assistant; on the Army Medical Library, by Dr. Robert Fletcher, F. R. C. S., Washington, and on parasites in man, by Prof. C. W. Stiles, Ph. D., of the Agricultural Department. The lectures and instruction outside the regular courses have been of great interest and benefit to the class, and the thanks of the faculty are due the gentlemen who gave them for their valuable aid.

The class in attendance on the full course was composed of the eight newly appointed medical officers, approved by the Army medical examining board in October, 1896. In addition there were five older medical officers, either on leave or stationed in the city and vicinity, who took part at least of the practical courses in the pathological and chemical laboratories.

The daily order of duties for the session just passed is appended, marked A. There has been no interruption of the work of the school by sickness or other cause, and the student officers have, as a rule, been prompt in attendance, attentive to their duties, and have greatly gratified the instructors by their diligence and the interest they have shown in their work.

Faculty meetings have been held on the first Monday in each month, as required by orders, and at other times when necessary.

At the examination held at the close of the session the relative proficiency of the student officers was found to be as follows:

Duties of medical officers: Dutcher, Fuller, Kemp and Skinner (equal), Cloud, Darnall, Richards, Smith.

Military surgery: Kemp, Fuller, Richards, Skinner and Darnall (equal), Dutcher, Smith, Cloud.

Military medicine: Kemp, Richards, Fuller, Darnall and Dutcher (equal), Skinner, Smith, Cloud.

Military hygiene: Kemp, Darnall, Richards, Skinner, Dutcher, Fuller, Smith, Cloud.

Sanitary chemistry: Kemp, Darnall, Richards, Skinner, Dutcher and Cloud (equal), Fuller, Smith.

Clinical and sanitary microscopy: Kemp and Darnall (equal), Dutcher, Richards, Skinner, Fuller, Cloud, Smith.

Hospital Corps drill: Darnall, Fuller, Dutcher, Richards and Smith (equal), Kemp, Skinner, Cloud.

The relative standing and percentages attained by each, taking all the branches into account, were as follows:

1. Asst. Surg. F. M. Kemp	92	5. Asst. Surg. L. A. Fuller	82
2. Asst. Surg. C. R. Darnall	88	6. Asst. Surg. G. A. Skinner	81
3. Asst. Surg. W. E. Richards	85	7. Asst. Surg. M. M. Cloud	74
4. Asst. Surg. B. H. Dutcher	83	8. Asst. Surg. L. P. Smith	73

The closing exercises of the session were held on Friday, March 12, at 3 p. m., in the library hall of the museum building. After introductory remarks by the President of the Faculty, the certificates of attendance were presented to the student officers, in the order of their standing at the school, by the Surgeon-General of the Army, with some brief words of advice. The exercises were concluded by a highly interesting address by Dr. S. C. Busey, of Washington, President of the District Medical Society.

Attention is respectfully invited to the reports of instruction in each branch by the professor or instructor therein, hereto appended and marked B, C, D, E, F, and G. It will be noted that several of these reports, especially those of the professors of military surgery, of military hygiene (who is also the director of the laboratory of sanitary chemistry), and the professor of clinical microscopy, show that more time is needed for instruction than the limit of the session—four months—now fixed by orders, allows. I heartily concur in their views and recommend that the term of instruction be extended to five months. This will give more time not only for the branches laid down in the official curriculum, but for instruction in operative surgery and optometry, which are considered highly desirable additions.

It is suggested that the 15th of November would be a preferable date for the beginning of the session to November 1, as at present. There is now hardly time between the close of the session of the examining board in October and the opening of the school for the appointments of the new assistant surgeons to be made out and accepted, for issuing the necessary orders, and for the journey from their homes to this city.

A bill providing in effect that the rank of medical officers passing through the school shall be determined by a combination of their marks at the entrance examination and at the close of instruction was introduced into the Fifty-fourth Congress, but was not finally acted on. Its passage would unquestionably be for the interests of the service.

The faculty of the school continues to be gratified by the good reports of efficiency and high standing of the young medical officers who have passed from their instruction.

Very respectfully,

C. H. ALDEN,
Assistant Surgeon-General, U. S. A., President Army Medical School.

A.

ARMY MEDICAL SCHOOL, WASHINGTON, D. C.

[Session of 1896-97, beginning November 4, 1896; ending March 12, 1897.]

ORDER OF DUTIES.

Daily, except Saturdays, Sundays, and holidays: 9 a. m. to 12 m., instruction in pathological laboratory; 1 p. m. to 2.50 p. m., instruction in chemical laboratory; 3 p. m., lecture. Saturdays: 9 a. m. to 10.15 a. m., instruction in Hospital Corps drill and first aid at Washington Barracks, D. C.; 11 a. m. to 12 m., instruction in equitation at Fort Myer.

There are no exercises on Sundays, Thanksgiving Day, December 25 to January 1, inclusive, and Washington's Birthday.

The lectures will be delivered as follows: Duties of medical officers, Wednesdays; military surgery, Thursdays; military medicine, Mondays; military hygiene, Tuesdays.

Hours for instruction in operative surgery and optometry will be announced hereafter.

Auxiliary lectures.—Military law, Lieut. Col. G. B. Davis, deputy judge-advocate-general, professor military law, United States Military Academy; mental diseases (clinical), at Government Hospital for Insane, Washington, Fridays, November 13 and 27, December 11, January 15; the Army Medical Library, Dr. Robert Fletcher, F. R. C. S., Eng., Monday, February 8; parasites in man, Prof. C. W. Stiles, Ph.D., Department of Agriculture, Fridays, beginning January 30.

Due notice of any change of programme will be posted on the bulletin board.

WALTER REED,
Major and Surgeon, United States Army, Secretary of the Faculty.

B.

DUTIES OF MEDICAL OFFICERS, ARMY MEDICAL SCHOOL, SESSION 1896-97.

By Asst. Surg. Gen. C. H. ALDEN, U. S. A.

NOTE.—The subjects taken up were substantially the same as those treated in former years, but owing to the appearance of a new edition of the Army Regulations, 1895, and of the Manual for the Medical Department, 1896, the lectures were necessarily revised. As far as possible the course has been made a practical one, exercises being conducted in the examination of recruits, the sanitary inspection of a post, the preparation of official reports, certificates, and other papers. I am under much obligation to Asst. Surg. Charles M. Gandy, U. S. A., the examiner of recruits at Washington Barracks, for valuable assistance in the instruction of the class in this important duty.

Lecture I.—Preliminary. The work of the medical officer compared with that of the civil practitioner. Military discipline; its nature, necessity, how it is secured, its obligation upon the medical officer. The importance of his sanitary and administrative duties. Change of duties with progress of art of war and civilization. The position of the medical officer in the military establishment, rank, title, command. The Geneva Convention. The Army Regulations; sketch of their development from first issue in 1779 to the present, especially as affecting the medical officer.

Lecture II.—Examination of recruits. How foreign armies are recruited. Organization of the United States Army recruiting service. The requirements of the general regulations and of the Medical Manual. Mode of examination. Necessity for method and thoroughness. Defects most commonly found. The personal-identification system and outline-figure cards.

Lectures III and IV.—Practical exercises in the examination of recruits at Washington Barracks. Method shown and student officers required to examine recruits and to prepare necessary papers.

Lecture V.—The sanitary duties of medical officers; their importance, origin, and development. Paragraph 1393, Army Regulations. Duties advisory, not executive. Regular monthly and emergency inspection and reports. Two classes of defects, of construction and of administration. Subjects to be looked into and reported on. Points requiring special attention in inspecting barracks and other buildings.

Lecture VI.—Practical exercises in sanitary inspection at Washington Barracks, D. C. Student officers shown method, and points requiring particular attention pointed out. Notes taken and report required.

Lecture VII.—Medical attendance. Regulations. Persons entitled to it, to issue of medicines, and to admission to hospital. Sick call; how conducted. Records and reports required. Private practice.

Lecture VIII.—Certificates of disability for discharge. Regulations. Method of procedure. Points to be specially regarded. Pension Bureau and its work in relation to Medical Department. Practical exercises in preparing certificates.

Lecture IX.—Disposition of insane soldiers, admission to Soldiers' Home, to Army and Navy General Hospital, Hot Springs. Transfer of enlisted men on account of health. Methods pursued and papers required. Certificates for sick leave for officers. Information specially demanded. Practical exercises in preparing certificates.

Lecture X.—Official correspondence; its channels and its forms. Property responsibility and accountability. How public property is received and how disposed of. Obligations resting upon the medical officer for the proper care, the economical and authorized use of public property.

Lecture XI.—Medical property. Special regulations of the manual taken up in detail. Necessary papers and returns. Examination of articles supplied by medical department deposited in the Army Medical Museum.

Lecture XII.—Service of hospitals. Paragraphs 1435 to 1449, Army Regulations. Assignment of duties, daily routine. Reports and returns. Army ration. Hospital fund; how it accrues, how it is expended. Durable property. Statement and returns. Construction and repair of hospitals. Estimates; how prepared. Inspection of work and report thereof.

Lecture XIII.—Medical officers in field. Importance of readiness for emergencies and detached service, inspection of field equipment, etc. Duties with scouting parties and larger commands, on the march, in camp, in action. Organization of the medical department of a division, brigade, and army corps. Duties on board transports. Field reports.

Lecture XIV.—Malingering, including concealment, feigning, and artificial production of disabilities. The principal diseases and injuries which are the subjects of malingering and the mode of detection.

Lecture XV.—Duties of the medical officer in command of a hospital corps detachment. Subsistence, clothing, equipment, instruction. Methods of enforcing discipline, force of example, division of duties, employment in personal service, transfer, discharge, death. Records kept. Reports and returns required.

C.

COURSE OF LECTURES ON MILITARY SURGERY, CARE AND TRANSPORTATION OF WOUNDED, AND ON HOSPITAL ADMINISTRATION, WITH A REPORT OF OPERATIONS DONE ON THE CADAVER AND SOME CLINICAL WORK AT BARNES HOSPITAL, SOLDIERS' HOME, ARMY MEDICAL SCHOOL, SESSION 1896-97.

Lecture I.—Introductory. The care of sick and wounded in time of war. Early history among different nations. Evolution of modern methods. Ancient and modern campaigns. Surgical literature of the subject. Influence of warfare on the progress of surgery.

Lecture II.—Military weapons, old and new, contrasted in their relation to military surgery. Evolution of the new small-caliber firearms; the new steel-cased bullet. The new artillery field guns and missiles; lightness, mobility and range, rapidity of fire, destructive effect. Chemical and physical properties of the smokeless powders. Specimens of ancient and modern guns, pistols and side arms, new and old missiles and powders. Target maps. Charts giving ballistic data of the small-caliber rifles now in use among different nations.

Lecture III.—Experimental effects of the new small-caliber, steel-cased rifle projectile and of the old lead bullet on inanimate objects. Openings of entrance and exit and the tracks of the bullet through various substances illustrated. Effects upon open and closed vessels with gaseous, fluid, semifluid, moist, and dry contents shown. Initial velocity, rotation, penetration, active energy, and heat produced in the barrel and by impact. Hydrodynamic theory of the so-called explosive effects of missiles. The trajectory, angle of ascending and descending limb, maximum ordinate, effective range and velocity at different ranges. Practical deductions. Numerous specimens, with tables, charts, plates, and drawings.

Lecture IV.—Effects of the small-caliber steel-cased bullet as a wound-producing missile on animal structures. Modifying influence of higher or lower velocities, larger or smaller caliber, and of greater or lesser resistance in the tissue. Moist and solid structures; fluid in the hollow viscera. Stability of the bullet, deformation, rupture, lodgment, lodgment of fragments. Literature of the subject, statistics, charts and illustrations from various sources.

Lecture V.—Explosive projectiles or those used with the artillery arms. Character and relative frequency of wounds by these missiles. The use of hollow explosive bullets with small arms; history and character; prohibition by international law. Illustrative cases and specimens.

Lecture VI.—General character of gunshot wounds made by modern firearms. Relative percentage of slight and severe wounds; mortality. Tracks of missiles through various structures. Fragments of compact bone as secondary missiles. Other secondary missiles. Lines of perforation, injury to vessels, nerves, and viscera. Influence of modern armaments on military tactics and the handling of wounded.

Lecture VII.—Hemorrhage and shock. Symptoms, comparison, and differential diagnosis. Character and frequency of gunshot hemorrhage, immediate, primary, and secondary. Regional injuries to vessels and hemorrhage; nature, diagnosis, prognosis, and treatment. Ligation in continuity and in the wound. Causes and management of secondary hemorrhage. Hemorrhage on the field, mortality, the tourniquet, asepsis. Nature, symptoms, diagnosis, prognosis, and treatment of shock. Statistics, illustrations, and specimens from the museum.

Lecture VIII.—Gunshot injuries of the head and neck. General and specific characters. Symptoms, diagnosis, prognosis, and treatment of common forms. Sequelæ. Illustrative cases and specimens.

Lecture IX.—Gunshot wounds of the chest and spine; superficial, penetrating, perforating, symptoms, complications, management. Illustrative cases from recent reports of chest wounds with the new small-caliber rifles.

Lecture X.—Gunshot wounds of the abdomen; symptoms, diagnosis, prognosis, and treatment. Penetrating and perforating wounds with and without visceral lesions, methods of differential diagnosis. Wounds in the different viscera, diagnostic symptoms, relative frequency, mortality. Laparotomy, methods of dealing with intestinal, hepatic, and other abdominal gunshot wounds. Comparative mortality under operative and expectant treatment. Illustrative cases.

Lecture XI.—Gunshot wounds of the extremities; relative frequency, description, prognosis, and management. Illustrated by numerous clinical reports showing the general character, course, and results of these injuries by the new small-caliber steel-cased bullet at various ranges. Colored plates of frozen sections and specimens.

Lecture XII.—Treatment of gunshot injuries. General treatment in hospital. Treatment of special cases. Treatment on the field. At the first-dressing stations, at the ambulance stations. Resources, material, deficiencies, contingencies. The question of asepsis in field practice, the protection of wounds, methods and practical suggestions.

Lecture XIII.—First aid to the wounded. Removal from firing line. Classification. Diagnosis tags. First-dressing stations, ambulance stations, field hospitals. Means of transportation. Brigade pack mules. Advance ambulance detachment.

Lecture XIV.—Practical application of the principles of military surgery discussed in foregoing lectures. Theoretical and practical lines of medical aid. Experience gained in past wars. Importance of treating for a time all the more severely wounded at or near the battlefield. War maps and charts.

Lecture XV.—Hospital administration. General principles which underlie administrative duties. Personal knowledge of details. Organization. Frequent inspection. Habits of industry, neatness, and order. Evil effects of idle time. Practical illustrations, blanks, forms, and methods.

OPERATIONS ON THE CADAVER.

Ligation of arteries	73
Amputations	59
Excisions	10
Resections	6
Trephining skull	4
Opening mastoid antrum	2
Division supraorbital nerve	1
Excision Gasserian ganglion (Krause-Hartley)	1
Enucleation eyeball	2
Opening antrum of Highmore	1
Division of inferior dental nerve	1
Partial excision tongue, Kocher's method	1
Removal submaxillary glands	1

Opening crico-thyroid membrane	1
Tracheotomy, upper two rings	2
Tapping right auricle	1
Tapping pericardium	1
Tapping pleural sac	1
Laminectomy, upper dorsal	1
Nephrectomy	2
Operation for varicocele (Bennet's)	1
Gastrostomy, Witzel's method	1
Pyloroplasty (Heinecke-Mikulicz)	1
Cholecystostomy	1
Cholecystenterostomy, Murphy button	1
Opening ductus communis choledochus	1
Removal of appendix vermiformis	2
Intestinal anastomosis (Maunsell's)	2
Intestinal anastomosis, various other methods	6
Suturing laparotomy wound	1
Supra-pubic cystotomy	1
Litholapaxy, Bigelow's method	1
Dissections of hand, foot, and leg	5

During the operative course the student officers were invited to attend the surgical clinics at Barnes Hospital on Sunday mornings, where during five Sundays they had an opportunity to assist in turn at the following operations: For radical cure of inguinal hernia; removal of cancer of the face; amputation leg, middle third; excision of old cicatrix, groin; for stricture urethra; exploration bladder, Leiter's cystoscope; paracentesis abdominis; for prolapsus ani with recto-perineal fistula; double orchidectomy for enlarged prostate and complete retention of urine; exploratory laparotomy for malignant tumor; ligation of hemorrhoids; clearing out knee joint for old adhesions and diseased tissue and wiring patella.

The operated cases were followed up and other cases in hospital studied. Every member of the class has worked hard and taken great interest in the course, both operative and didactic.

Candidates for admission to the Medical Corps are often found deficient in the practical details of operative surgery. The opportunities afforded for careful instruction of the student officers in this important branch have been thus far somewhat limited, being only available at irregular hours deducted from the already overcrowded and equally necessary work in the laboratory or lecture room. When operations on the cadaver are begun they should continue on consecutive days until the material is used up to prevent deterioration and waste. Under these circumstances and in view of the great benefits to be derived from this practical part of the course, it would seem desirable that more time and some regular hours should be devoted to it as a subject of instruction independent of the other branches.

W. H. FORWOOD,
Lieut. Col. Deputy Surgeon-General, U. S. A.,
Professor of Military Surgery.

D.

UNITED STATES ARMY MUSEUM AND LIBRARY,
Washington, D. C., March 15, 1897.

SIR: I have the honor to report that during the session of the Army Medical School just closed the subject of military medicine has been discussed in a course of nine lectures, a synopsis of which is herewith appended.

In view of the fact that the students have but recently finished the usual curriculum of medical and hospital study, and also that clinical facilities are not at hand, the course has dealt largely with the historical and geographical features of diseases and epidemic invasions which have affected armies in the past, as well as in the enunciation of the practical principles to be observed for the prevention of disease and the conservation of the health and efficiency of our Army.

I am, very respectfully,

D. L. HUNTINGTON,
Deputy Surgeon-General, U. S. A., Professor of Military Medicine.

Col. C. H. ALDEN,
Assistant Surgeon-General, U. S. A., President Army Medical School.

MILITARY MEDICINE, COURSE OF 1896-97.

Lecture I.—Military medicine. Definition and application. Sketch of early history of military medicine and its literature. Modern military medicine. Consideration of the soldier as the unit of military organization with reference to qualities demanded for military service. General remarks on diseases of armies. Intimate relation of military medicine, surgery, and hygiene. Considerations affecting the health of armies, as active military operations in times of war; conditions of peace; water and food supplies; climate; ochlesis; malarial influences; scorbutic influences; moral conditions; social or individual conditions, with general observations and illustrations.

Lecture II.—Diseases prevalent in armies in time of peace and particularly with reference to the United States Army. Geographical extent of the United States; climatic features; geographical features; ethnological and sociological features; military posts, their location and purposes. Duties and occupation of soldiers in time of peace with relation to health and disease. Diseases most commonly met with at all posts. Diseases of the digestive system. Diseases of the respiratory system, etc.

Lecture III.—Conditions of health and disease in armies in time of peace, continued. Diseases of the circulatory system. Diseases of the nervous system. Rheumatic affections. Venereal diseases. Alcoholism. General remarks on army practice.

Lecture IV.—Diseases and conditions affecting troops on field duty and during marches, whether in peace or war. Mobilization and centralization. Transportation by land or water. Conditions to be observed as affecting health and comfort of troops on marches, with general observations on marching troops, and status of active field duty.

Lecture V.—Specific infectious diseases; measles, scarlet fever, diphtheria, and smallpox. Vaccination and revaccination. Remarks on army diarrhea and dysentery. Importance of military hygiene with reference to invasion and diffusion of disease.

Lecture VI.—Specific infectious diseases, continued. Malarial fevers and malarial cachexiæ, with historical sketch.

Lecture VII.—Specific infectious diseases, continued. Typhoid fever in armies, epidemic influenza, dengue, and the febriculæ, with historical sketches.

Lecture VIII.—Specific infectious diseases, continued. Typhus fever, yellow fever, cerebrospinal meningitis, with historical accounts of each.

Lecture IX.—Specific infectious diseases, continued. Asiatic cholera, with historical review of epidemics; glanders, with its relation to the military service. General observations on preventive medicine.

E.

WAR DEPARTMENT, SURGEON-GENERAL'S OFFICE,
Washington, March 11, 1897.

SIR: I have the honor to report that work in the chemical laboratory for the session 1896-97 ended on Friday, March 5, and that the course on military hygiene was concluded by a written examination on the afternoon of Wednesday, March 10, 1897.

It gives me great pleasure to have this opportunity of commending the student officers of this class for the earnest manner in which they conducted their work in the laboratory. This work began officially at 1 p. m. daily (Saturdays excepted), but it actually began with most of the class twenty or thirty minutes before that hour, and many experiments were finished or repeated in hours that were outside of the scheduled time. It was a pleasure to teach where the desire to learn was so manifest. The attendance was excellent. No one was absent, either from sickness or other cause, on any occasion. The course covered the same ground as during the previous year. On account of the unfamiliarity of the students with the analytical methods of general chemistry, a considerable part of the earlier half of the session had to be spent in work preliminary to the special processes of volumetric and sanitary analysis. The addition of two or three weeks to the length of the session would aid materially in perfecting this course of study.

I find also that the weekly lecture during the session, in all fifteen or sixteen lectures, is insufficient to do justice to the various subjects that have to be considered in a course of military hygiene. Last year I reported to you the outline of the course as presented in fifteen lectures. This year I dealt with the same subjects in sixteen lectures, but many of the subjects could have been presented at greater length with material advantage to the students. I desire to suggest that, if consistent with other interests, the course on military hygiene be extended to twenty lectures.

Capt. F. R. Keefer spent some time in the laboratory while the subject under investigation was the sanitary analysis of waters. He distinguished himself by the care and manipulative tact with which he conducted his experiments.

Respectfully,

CH. SMART,
Major and Surgeon, U. S. A., Professor of Military Hygiene and Director of the Chemical Laboratory.

Col. C. H. ALDEN,
President of the Faculty, Army Medical School.

SUMMARY OF LECTURES ON MILITARY HYGIENE.

I. The general history of hygiene, leading up to present sanitary conditions and the present status and duties of health officers.

II. Sites of camps. Surface configuration; natural drainage; subsoil water; malaria; made ground; old camping grounds. Plan of military camps; density of population. Tents.

III. Campaigning. Shelter tents; brush shanties; dugouts and log huts; drainage, sinks, and water supplies. Cleanness; regimental and company police; personal police. Marches. Physical training.

IV. Plan of permanent posts. Dryness of barracks; cellars; subfloor spaces; ground air; rainfall. Casemates. Cleanness. Lighting; mineral oil; coal gas; water gas. Warming; open fireplaces; stoves.

V. Warming continued. Hot-air systems; hot-water systems; steam heating.

VI. Physical aspects of air. Pressure; light; heat; moisture; electrical conditions. General circulation. Local conditions; storms; climate.

VII. Medical climatology. Prevention of diseases of exposure. Chemical aspects of air; oxygen; carbon dioxid; organic matters.

VIII. Respired air. Analysis; calculation of ventilation from results of analysis. Ventilation, natural and artificial.

IX. Impurities of air. Methods of investigating; dust; nitrogenous exhalations; sewer air.

X. Character of waters. Cistern waters; pond, ditch, and swamp waters; lake and river waters; subsoil waters; deep well waters. Effects of impure waters from dissolved matters; from suspended matters.

XI. Effects of impure waters continued. Cholera; typhoid fever; malarial fever. Analysis of waters; history; the residue on evaporation; the oxidation of organic matter.

XII. Analysis continued. Ammonia from albuminoids; from urea; nitrites; nitrates; chlorine; examination of sediment; inspection of surroundings of source of supply.

XIII. Purification of water. Distillation; sedimentation; filtration; mechanical filtration; coagulants; special processes.

XIV. Sewage. Dry-earth methods of disposal; cesspools; pneumatic methods. The soil pipe and its attached fixtures.

XV. Sewers. Combined system; separate system. Disposal of sewage; chemical treatment; irrigation; filtration.

XVI. Calculation of the calorific value of articles of diet. Standard diets; emergency rations.

F.

UNITED STATES ARMY MEDICAL MUSEUM AND LIBRARY,
Washington, D. C., March 22, 1897.

SIR: I beg to submit the following report of the work done in the pathological laboratory during the third session of the Army Medical School:

At the commencement of the session I had proposed to divide the work into a course in bacteriology to cover the time up to the Christmas holidays, and a course in clinical microscopy to embrace the latter half of the session, as had been done during the second session of the school.

With this idea in view, the preparation by the several members of the class of the various culture media was at first taught; and when this had been accomplished, the technique of cover-slip staining, plating, Esmarch rolls, etc., was demonstrated. For acquiring the necessary facility in this particular, several chromogenic organisms, such as *B. prodigiosus, B. violaceus,* and *B. pyocyaneus,* were studied.

As soon as possible thereafter the group of pathogenic micrococci was given out for study, including the pyogenic bacteria and micrococcus pneumoniæ crouposæ. Inoculations of animals were made, and the method of taking cultures from the various organs was demonstrated in connection with the study of these bacteria. A

group of bacilli was next carefully studied, including Friedlander's colon bacillus, lactis ærogenes, typhoid bacillus, anthrax, bacillus of diphtheria, etc. Spore and flagella staining were successfully and repeatedly made by the students. Particular attention was given, as heretofore, to the biological characters of the bacillus and pseudobacillus diphtheriæ. Practical work was obtained in the examination of serum tubes inoculated from the throats of sick children, through the courtesy of the health officer of the District of Columbia.

The success of the several members of the class in deciding the character of the throat infections was very encouraging. In connection with the study of the typhoid bacillus, the class was repeatedly exercised with the use of Johnston's modification of Widal's test for the diagnosis of typhoid fever, not only with the blood of typhoid-fever patients, but with specimens of normal blood and the blood of other diseases. With the study of the group of spirilla, including *S. choleræ asiaticæ, S. Deneke, S. Finkler-Prior, S. Metchnikovii, etc.*, the bacteriological part of the work was brought to a close.

The latter half of the session was devoted to the microscopic investigation of sputum, urine, blood, and tumors. In addition to this work an attempt was made to give a course in pathological histology, especially as it was discovered that only one or two at most of the students had any familiarity with the microscopic appearances of diseased tissues.

Much to my own gratification, it had been for some time evident that this particular class, by reason of the faithful and earnest efforts of its members, was capable of more work than had already been mapped out for the session. For this reason, early in January, a careful and systematic study of inflammation was begun and followed with the several diseases of the liver and lung. I had hoped to complete this course with the study of the diseases of the kidney, spleen, and intestine, but the time at my disposal was not sufficient for this purpose. Indeed, much to my regret, I was unable to complete the full and necessary study of the various pathological conditions of the blood.

Coming to this work without previous experience as a teacher, I am only now just learning what the course in my department should embrace, and I am convinced that until such time as the medical schools graduate men who are well-grounded in pathological histology, provision must be made for this instruction in the Army Medical School. This can not be done and will not again be undertaken unless the session of the school can be extended. Five months will hardly be sufficient. Six would be better. Then neither students nor instructor would feel that they were being daily hurried with the important work in hand. I respectfully urge this matter upon the attention of the proper authority.

In addition to the eight student officers, three other medical officers of the Army availed themselves of special parts of the course of instruction.

Very respectfully,

WALTER REED,
Surgeon, United States Army, Professor of Clinical and Sanitary Microscopy.

Col. C. H. ALDEN,
Assistant Surgeon-General, U. S. A., President Army Medical School.

G.

WASHINGTON BARRACKS, D. C., *March 13, 1897.*

SIR: I have the honor to report as follows upon the course of instruction in Hospital Corps drill and first aid during the session of the Army Medical School just terminated.

During the early part of the session an active drill in the school of the soldier was given daily for one-half hour. This drill included the position of the soldier, facings, salutes with the hand, manual of the sword, marchings, turnings, halts, setting-up exercises, and instruction in the execution of all commands necessary for the drilling and maneuvering of a detachment.

During the remainder of the session the student officers reported at the barracks of the company of instruction of the Hospital Corps at Washington Barracks at 9.10 a. m., every Saturday. Here they were required to take part in the official inspections of the company, after which they were drilled for one-half to three-quarters of an hour in the various movements contemplated by the drill regulations for the Hospital Corps.

In these, as in the school of the soldier, they became markedly proficient, when the brevity and fewness of drills is considered.

Frequent informal talks on customs of the service, military deportment, discipline,

first aid, equipment of the Army Medical Corps, and duty of its officers in active service were held.

The course in equitation, given at Fort Myer, Va., on each Saturday morning by Lieut. H. A. White, Sixth Cavalry, was found to be not only of great benefit to the officers of the class, but of great interest to them.

Very respectfully, your obedient servant,

FRANK R. KEEFER,
Captain and Assistant Surgeon, United States Army.

Col. CHARLES H. ALDEN,
Assistant Surgeon-General, U. S. A., President Army Medical School.

RECRUITING.

The total number of men examined for enlistment during the calendar year was 14,659, of whom 8,654, or 590.35 per thousand, were accepted, 5,448, or 371.65 per thousand, were rejected on primary examination, and 557, or 38 per thousand, subsequently declined enlistment. The ratio of accepted men per thousand of those examined is considerably larger than the rates of previous years. In 1893 the rate was 433.35; in 1894, 451.04, and in 1895, 489.83. This must be regarded as meaning that better men physically are coming up as candidates for enlistment. The rejections among the colored men were relatively somewhat more numerous than among the white candidates for enlistment—379 as compared with 371.04 per thousand, respectively.

Of every thousand men examined, 115.36 were rejected on account of imperfect physique, under or over weight or height; 51.50 for diseases of the eye; 33.36 for diseases of the genito-urinary organs; 30.36 for diseases of the circulatory organs; 21.15 for diseases of the digestive system; 16.10 for venereal diseases; 6.75 for rupture; 10.09 for illiteracy and imperfect knowledge of English, and 22.92 for general unfitness or undesirable character.

Of every thousand accepted recruits, 750.87 were natives of the United States—674.26 white and 76.61 colored. In 1895 the proportion of German and Irish born recruits fell for the first time to less than 90 per thousand. This decrease continued during the past year, when Germany furnished only 74.53 and Ireland 74.30. England contributed 25.20; Canada, 15.37; Sweden, 11.67; Denmark, 8.09; Austria, 7.16, and other countries less than the last-mentioned rate.

Of the 8,654 accepted recruits only 53 were under 20 years of age (mean age, 17 years). Nearly one-half or a total of 4,039 men were between the ages of 20 and 24 years (mean age, 22 years); 515 of these were foreign-born, 244 were negroes, and 3,280 native born whites. The mean height of the colored recruit of this age was 67.25 inches; of the native white recruit 67.76 inches, and of the foreign-born 67.11 inches. The mean weights did not correspond with the heights, for the native whites were the lightest, having an average weight of 143.47 pounds, while the foreign-born weighed 143.98 and the colored men 144.55 pounds. The foreign-born had the advantage in capacity of chest, the average measurements being 37.27 inches at inspiration and 34.32 at expiration, the native whites measuring 36.82 and 33.93, and the colored men 36.31 and 33.76 inches.

There were 2,455 recruits between the ages of 25 to 29 (mean, 26.7 years); 1,550 of these were native whites, 730 foreign-born, and 175 colored. The average height of these recruits did not differ materially from that of the younger men. The weight was somewhat increased, the negro continuing to lead with 149.42 pounds, the foreign-born following with 147.16 pounds, and the native whites with 146.24 pounds. The capacity of the chest was slightly increased at this age, the foreign

born continuing to have the advantage; inspiration, 37.74 inches; expiration, 34.67, while the native whites measured 37.26 and 34.28, and the negroes 36.82 and 34.16 inches.

The averages for the whole number of recruits give the foreign-born the advantage over the native white in weight and chest measurement, although the latter is taller by half an inch. These results are practically the same as those derived from the statistics of previous years.

PHYSICAL EXAMINATION OF CADETS, UNITED STATES MILITARY ACADEMY, WEST POINT, N. Y.

The report of a medical examining board convened at West Point, N. Y., August 20, 1894, indicated that a considerable number of cadets had become affected with heart disease while at the Military Academy. The usual character of the disease as reported was said to be aortic obstruction. The board found each of the cadets in whom this condition was recognized as "physically disqualified," but recommended that he be continued at the Academy on probation for six months. Maj. George H. Torney, surgeon, United States Army, was directed by me to make a careful investigation of these cases and to inquire into the medical history of the cadets so affected prior to their appointment and while at West Point, and into their habits, as to the use of tobacco, athletic exercises, etc., with a view to determine the probable cause of the diseased condition. He was required also to keep these cadets under special medical observation to ascertain whether there was evidence that the valvular disease was progressive in character. Under date June 23, 1897, Major Torney made his report, which is a very gratifying one, as it shows that in nine of the ten cases reported by the board as disqualified, but fortunately saved to the service by the clause allowing a probationary continuance at the Academy, the heart was free from structural lesion, and there was no symptom of mechanical derangement of the circulation or of heart strain. The observations on these cases were made from time to time as each individual came under treatment for incidental ailments and in the ordinary routine of clinical examination, without the knowledge of the patient as to its intent and purpose.

The first and second cases reported were under observation for five months, when both were discharged for academic deficiencies. No heart murmur was heard in either of these cases. The third and fourth cases were under observation for ten months, until their graduation, in June, 1895, when both passed the medical examining board without question. Case 4 was a young man of fine physique, in whom no heart murmur was heard at any of the examinations, but in case 3 there was at times an indistinct functional murmur at the base of the heart, but never heard at the apex. Cases 5 and 6 were under observation until June, 1896. No heart murmur was heard at any of the examinations, and the medical board at graduation passed both without question, although aware of their previous history. The four remaining cases were under observation for thirty-two months, until their graduation, in June of the present year. In case 7 the report of the board which found him disqualified in 1894 reads as follows:

Because of defective physical proportions—height, 5 feet 9 inches; weight, 121 pounds; expiration, 30 inches; inspiration, 33 inches—and because of incipient symptoms of consolidation at apex of right lung; slight valvular disease of the heart, with quick, irritable pulse and moderate varicocele left side.

At no time during the period of observation did this cadet present any evidence of heart disease. It is reported of him that, although slender—

his muscular power and activity were very great. He had been a prize winner for three years in many of the athletic events of the Academy, and in March, 1897, he was awarded by the Army Officers' Athletic Association the prize for all-round athletics, having won the greatest number of prizes in the individual contests.

He was the only one of the ten cadets under observation who was in the habit of using tobacco. In cases 8 and 9 no evidence of heart disease was discovered. In case 10 the murmur heard by the board in 1894 persisted, and appeared to be due to a slight thickening of the aortic valves, but there was no derangement of the circulation and no hypertrophy of the organ. He was examined by a medical board June 11, 1897, and in reviewing his case the prognosis was considered favorable and the condition not incompatible with the exigencies of the military service.

As a result of the continued observation and study of these cases, the conclusion was reached that in all except the last-mentioned case the murmur heard in each individual at the time of the examination of these cadets in 1894 was due to "a temporary irritability of the heart, caused by the nervous excitement attending the ordeal of examination."

IDENTIFICATION OF DESERTERS AND OTHER UNDESIRABLE MEN.

Every man prior to enlistment in the Army is examined as to his physical qualifications to undertake military duty, but in addition to this he is subjected to a careful scrutiny for scars, moles, tattooings, and other permanent marks on his person by which his identification may subsequently be effected. These are set down in their proper regional location on an "identification card"—a card having in outline a front and back view of the human figure. The card of each recruit as soon as completed is forwarded to this office, where it is compared with the cards of the deserters, ex military convicts, and other undesirable men that have been accumulated during the eight years since this system was instituted. Should the result of this investigation be favorable to the man, his card is then placed in the alphabetical file of the Army. This office is thus provided with an identification card for every enlisted man now in the military service, and with similar cards for all the men that have deserted or been dishonorably discharged for cause during the past eight years. When a man deserts or is shown by his record to be an undesirable man, transcripts of his card are made and placed in the files of undesirable men, with such precautions as will insure the identification of the individual when search is made. To effect this, each transcript is filed in accordance with the location of one of the prominent scars delineated upon it. For instance, a deserter who has a notable scar on the right forehead, another on the left wrist, and a third over the right tarsus has three transcripts of his card made and filed in his case, so that if he comes up again as a recruit any one of these three scars will suffice to suggest further inquiry leading to his identification.

The transcript cards are filed, in accordance with the location of the scars, into 105 regions or divisions of the surface of the body. Each of these divisions of the files is subdivided by height into 17 sections, beginning with "64 inches and under" and proceeding by half-inch gradations to "72 inches and over," and each of these sections is, if

need be, separated into two groups by color of eyes—blue or brown. To permit of accuracy in the determination of color, chromolithographed standard eye colors have been issued to medical and recruiting officers, by which the various shades may be indicated with precision, as blue No. 10, brown No. 4, etc. The cards of all undesirable men having the same height and color of eyes, with prominent scars similarly situated on the body, are thus brought together and used with facility for purposes of comparison and identification. Another division of the files is arranged in accordance with the location of birthmarks, including moles, and these are subdivided, as in the case of scars, by height and color of eyes. These two divisions give 7,140 final groups—$2 \times 105 \times 17 \times 2 = 7,140$. Up to this time some of the subfiles have not required division by height or color of eyes, on account of the small accumulation of cards of that particular kind. The cards of men who have suffered slight mutilation, such as loss of part of the ear, toes, or fingers, give 23 subfiles, without subdivision by height or eye color. A fourth subdivision consists of tattoo markings, including letters, initials, words, phrases, numerals, hearts, crosses, anchors, sunbursts, flags, coats of arms, ballet girls, etc., all of which are grouped by location.

Separate files are kept for white and for colored men. The negroes are not subdivided by eye color.

When the identification card of a reenlisted man is received it is placed in the alphabetic file with the card of his previous enlistment, with which it is compared. A deserter or other undesirable man enlisting under the name and claiming the former service of another man who has an honorable record is thus detected as an impostor. If the case is claimed to be one of first enlistment, the card is compared with those in the transcript files having prominent scars, etc., similarly situated. The subdivisions of height are examined for 1 inch below and half an inch above the height recorded on the recruit card. If the man is not identified by this search, his card is placed in the alphabetic file; but if he is identified, copies of the cards of his present and former enlistments and of the examination forms pertaining to his case are transmitted to the Adjutant-General, with a letter reporting the identification. If the man is a deserter, the Adjutant-General telegraphs the order for his arrest, sending the papers in the case by mail. When these reach the post where the recruit is stationed, the surgeon is usually required by the commanding officer to examine the suspected man in connection with the identification cards and to express his views on the question of identity. If the evidence of identity appears to be satisfactory, the commanding officer causes appropriate charges to be preferred against the man, who is then tried by a general court-martial, or in some cases discharged by order of the War Department without the delay and expense of a court.

The total number of identification cards of recruits in the files June 30, 1897, was 68,834. A large proportion of these cards are for soldiers reenlisting, and do not require comparison with the transcript cards of delinquent ex-soldiers, but take their place at once in the alphabetical file. Of 8,575 cards received in 1896, 4,032, or 47 per cent, and of 3,696 received up to June 30, 1897, 1,832, or 49½ per cent were for reenlistments. Cards of first enlistment requiring comparison of the transcripts during 1896 and up to June 30, 1897, numbered 6,407, or 52 per cent of the whole.

In addition to the 68,834 cards of recruits referred to above, 4,222 have been received to June 30, 1897, for released military convicts, or soldiers discharged dishonorably or without honor. The total number

of identification cards in the files was, therefore, at that date 73,056. This number does not, however, represent so many men, as two or more cards for the same individual are not uncommon. Nearly all the cards now rendered at reenlistment or dishonorable discharge are for men who have previous cards on file. These double records furnish the best of evidence as to the permanency of marks and prove an invaluable guide in making the transcripts for the delinquent file.

The work of making transcripts was begun in 1893. To June 30, 1897, 46,417 had been made for 15,436 delinquent soldiers, an average of 3.01 per man; 5,062 were made in 1896, or 2.61 per man, and 1,840 to June 30, 1897, equaling 2.37 per man. The diminishing average represents not only increased excellence in the identification cards, but greater experience in this office as to the relative reliability of marks.

Meanwhile 13,206 transcripts of 2,796 men have been canceled; some upon the receipt of later and better cards, whereupon new transcripts have been made and filed; others because the identification cards from which they were taken, made early in the history of the system, gave too poor a description to be satisfactory as a means of identification, and the remainder because the men described thereon had by the lapse of time grown too old, it is thought, to pass themselves off as under 30, the maximum age of first enlistment.

On June 30, 1897, there remained in the transcript files 33,211 cards of 12,640 delinquent soldiers—2.63 per man. A revision of these files is in progress to lessen the number of transcripts. During the six months ending June 30 last the average for new delinquents has been 2.37; this, for the 12,640 men now in the file, would give 29,957 transcripts, indicating that there are still in the neighborhood of 3,300 which may safely be canceled without impairing the efficiency of the system.

The identification system has proved an excellent safeguard to the Army. The Bertillon system of measurements is merely an index by which the card or record of an individual may be discovered in a mass of others; his identity is determined or corroborated subsequently by a study of personal marks and other data. An error in any one of the various measurements will throw the investigator off the track of the required individual. In the system of this office the personal marks themselves constitute the index, and there is no liability to get off the track except in the case of height, which is specially guarded, as above stated.

The identification card, or outline-figure card as it was originally called, divides the surface of the body into regions on which not only the location but also the relative size and other special characteristics of the scars and marks may be delineated with accuracy, thus avoiding the necessity of writing and reading descriptions, which, however accurately they may be worded, can not give as prompt and clear an idea as the outline of the scar properly placed upon its anatomical site on the card. Since the identification card has been in use 820 identifications have been made. The weeding out of these men from the ranks has undoubtedly improved the morale of the Army. There are now in the files of this office data sufficient for the identification of 12,640 men whose records show them to be undesirable associates for honorable young men serving in the ranks, and who can be denied enlistment as soon as their cards are received from the recruiting office.

From July 19, 1890, when the first identification was made, to June 30, 1897, the whole number of identifications by means of the cards was 820 (deserters, 366; soldiers dishonorably discharged from former

service, 248; others, 206). In 200 cases (deserters, 124; dishonorably discharged soldiers, 36; others, 40) the identification was of value only to connect the several enlistments of men no longer in service. Three cases were applicants for enlistment identified at the instance of recruiting officers. One, a deserter, and another, a former military convict, left the recruiting station pending the receipt of information from this office concerning their identity; the third, also a former military convict, was rejected by the recruiting officer when the information arrived.

In 617 cases the men were in service and amenable to punishment when identified—241 as deserters, 210 as soldiers dishonorably discharged from former service, and 166 as frauds of a minor grade. Of these, 53 deserted before final disposition was made of their cases, 477 were discharged the service by sentence of court-martial or by orders from the Adjutant-General's Office, 86 were held to service for the time being, and 1 at present awaits final action.

Of the whole number of identifications, 18 were made in the calendar year 1890, 111 in 1891, 215 in 1892, 104 in 1893, 110 in 1894, 121 in 1895, 108 in 1896, and 33 during the first six months of 1897. Of the identifications of men still in service, 18 were made in 1890, 88 in 1891, 123 in 1892, 88 in 1893, 80 in 1894, 101 in 1895, 95 in 1896, and 24 to June 30, 1897.

The 121 identifications made in 1895 represent the "repeating" element of 4,929 recruits, whose identification cards were examined—i. e., of every 1,000 recruits from civil life, 24.55 were identified through the cards as deserters, military convicts, or otherwise bad characters. Similar results appear for 1896 (identifications, 108; recruit cards examined, 4,658; identified, per thousand, 23.19); likewise for the first six months of 1897 (identifications, 33; recruit cards examined, 2,076; identified, per thousand, 15.90).

CAMP AT THE TENNESSEE CENTENNIAL EXPOSITION GROUNDS.

The following report from Capt. R. J. Gibson, assistant surgeon, U. S. A., shows the condition of the troops on the establishment of Camp Taylor on the exposition grounds at Nashville, Tenn.:

I have the honor to report that the band and Companies A, E, F, and H, Sixth Infantry, commanded by Maj. C. W. Miner, Sixth Infantry, arrived on the exposition grounds on the evening of June 7, 1897. The command was accompanied by one medical officer, one acting hospital steward, and two privates of the Hospital Corps. The site selected for the camp is located on the east side of the exposition grounds. It slopes gently toward the north and west, and is well drained. Bounding the camp site on the west and north is a creek, which, with its branches, drains the entire exposition grounds. This creek flows toward the north. An inspection of its course through the grounds showed that it had its origin from springs just beyond the exposition fence. No water-closets or sewers could be discovered discharging into the creek, but I understand that some of the vaults connected with the exposition buildings do occasionally overflow and discharge their contents into the creek. Beyond the creek is a small lake with inlet and outlet, the water constantly changing. Close to this lake and about 100 yards from the camp is a spring of cool, clear water. This spring is so located that it is certain to be contaminated by surface washings and overflow from the vaults referred to. On this account company commanders were advised to warn their men to avoid the use of this water for all purposes. A system of pipes connected with the city system was completed June 8, and an abundance of water of excellent character furnished for the command. The faucets are convenient to the company kitchens. The city water is obtained from the Cumberland River, above the city of Nashville, and it is filtered through gravel beds before being pumped into the reservoirs. As the water is likely to produce diarrhea in persons unaccustomed to its use, company commanders were advised to have it boiled before using. Ice was furnished in limited quantity by the exposition

authorities at first for six water barrels, but later for three only. The supply of ice has not been sufficent. A frame bath house, with separate compartments for officers and men, was in readiness for the command, and is furnished with facilities for taking sixteen shower baths at one time. Frame buildings, one for each company and one for the officers, were erected and in readiness for the troops. They are supplied with urinals, and all discharges are received in galvanized-iron boxes, and removed daily beyond the exposition grounds. They are disinfected daily under the direction of the centennial health officer. They are also inspected daily by both the quartermaster and the surgeon of the camp. The rations have been sufficient in quantity and variety, and have been well cooked and served. An abundant supply of tents was received, and in no case are there more than two men to one tent.

Undress uniform, with white helmets, has been worn at most of the parades and ceremonies. The change of water produced diarrheal trouble among the men at the beginning of the camp; 22 were taken on sick report on this account and a large number treated for this complaint without being excused from any duty. One case of typhoid fever was taken into the camp hospital June 25, eighteen days after arrival in Nashville; a case of fever, apparently of malarial origin, was admitted on June 24. Both patients were transferred to Fort Thomas, Ky., June 30. There were 36 cases admitted upon sick report during the month; 32 were returned to duty, 2 were transferred to Fort Thomas, and 2 were remaining under treatment on the last day of the month.

PROBLEMS ON MILITARY MEDICAL ADMINISTRATION.

Lieut. Col. A. A. Woodhull, deputy surgeon-general, chief surgeon Department of the Colorado, has for some time past issued at regular intervals to the medical officers in his department certain problems on military medical administration. Some of these were intended for discussion by lieutenants, others by captains, and others again by majors. Each medical officer in the department was required to discuss the problems submitted to those of his grade, and was invited to report on the other problems. No attempt was made to establish a merit roll for the papers sent in or in any way to give to these discussions the character of an examination, but it was announced that the attention of the Surgeon-General would be invited to papers, which were considered to be particularly meritorious. Practically the problems and their solution constituted a consideration by the chief surgeon of the department and his medical officers of the best method of action to be adopted by army medical officers under certain given conditions.

The nature of the discussions may be understood from the following outline of some of the problems issued. For lieutentants: (1) The measures to be adopted on the occurrence of smallpox on a transport with 5 per cent of the troops wholly unprotected and 20 per cent but partially protected by vaccination, and no vaccine lymph available; (2) the measures to be adopted on the occurrence of smallpox and measles in a detachment of recruits in march to a western military post; (3) the medical provision for and management of a command of one brigade of infantry and one regiment of cavalry operating for three months against guerrillas. For captains: (1) The medical arrangements for and management of 600 infantry and 120 cavalry in march from Fort Bliss, Tex., to Fort Bayard, N. Mex., under ordinary summer conditions, and again when a probability of choleraic infection has been reported; (2) the action to be taken by a post surgeon on the arrival at his post of a party of recruits with the infection of measles and smallpox; (3) the diseases which would be likely to affect 10 per cent of the command and cause many deaths in a division of newly raised volunteer infantry encamped from June to September on the banks of the Ohio River, near Fort Thomas, with the conditions which a medical inspector would be likely to find in the camp and the recommendations he would probably have occasion to make. For majors: (1) The arguments for accepting

one of two sites proposed as a camping ground for a command of 1,000 infantry and 200 cavalry, the environment having a possible influence on the sanitary conditions being fully described; also the arrangement of the camp, the equipment of the medical department, and the strength and organization of its hospital corps; (2) the needs as to quarters, rations, clothing, medical service, hospital organization, etc., of a division of troops going into winter quarters near Houlton, Me.; (3) the probable duties that would engage the attention of a chief surgeon, and the orders he would have occasion to write during an action in which 25,000 men were engaged under stated conditions.

The solutions of certain problems by Majors Gardner and Kimball and Captains Everts and Polhemus were forwarded to this office and due acknowledgment was made to these officers for their able and earnest discussion of the subjects.

. An excellent paper by Captain Everts, discussing the insanitary conditions that would prove dangerous to a division of newly raised volunteer troops camped in the autumn on the Ohio, near Fort Thomas, Ky., is herewith submitted, as illustrative of the thoughtful consideration given to the solution of these administrative problems in the Department of the Colorado.

The troops are in three brigade camps, a mile apart, on the left bank of the Ohio, above Fort Thomas.

From the best information at hand concerning this locality, the following conditions are believed to exist: The Kentucky shore of the Ohio, along the camp, rises in precipitous clay bluffs some 200 or 300 feet above the river. Back from the river, the land stretches comparatively level to the foothills, 3 to 5 miles away. There is a good slope down the river, which should afford surface drainage. The country around is farmed. The nature of the ground under the camps is not known, but it is presumed that there is a considerable depth of loose soil containing vegetable mold. The annual rainfall is about 40 inches, half of which falls from May to September, inclusive. Elevation above sea level is 800 to 900 feet. During the months above named, the daytime temperature runs from 80° to 95°. The nights are warm, not going often below 60°. The Chesapeake and Ohio Railroad runs along the Kentucky side of the Ohio, through or near the camp.

The camp is occupied by a division of newly raised infantry volunteers, recruited from the central Western States.

This means that the soldiers and company officers are mostly drawn from the small towns and country districts. The medical officers too, come from civil life, and with little knowledge and less experience of the unusual requirements of their positions. Statistics of the recruiting service of our Regular Army show that half of those presenting themselves for enlistment are rejected, and that most of those rejected have disabilities that would cause them to break down under the conditions of army life. Experience has shown that in recruiting volunteers, rejections for physical disabilities represent a small percentage of those who want to join the Army. Experience has shown too, that, under like conditions, troops raised newly, in rural districts, will suffer from sickness twice as much as those taken from cities, and about four times as much as seasoned soldiers. This arises probably from the later physical and mental immaturity common to both sexes and to their monotonous habits of life and consequent inability to meet quickly the unusual conditions in which they are placed. The change of food and water, the nights of broken rest, the constraint of uniform and physical deportment, their inaptitude for helping themselves, homesickness, all conspire to lower the standard of health. Furthermore, a smaller per cent are protected by previous attacks of the ordinary infectious diseases.

The camp, when first occupied, was intended only for temporary purposes, and this knowledge might easily lead those in authority to neglect strict sanitary measures. The troops went into camp June 1, and by July 10 the sick list represented 10 per cent of the command, and ninety deaths had occurred. The high rate of sickness would not excite surprise, but the death rate, occurring so early, would not be expected.

Visiting the camp as medical director July 15, I would expect to find the medical condition of the camp bad in many or all of the following particulars:

Tents overcrowded; ventilation of tents and bedding neglected.

Poor drainage of surface water after rainfalls; tent ground damp and men sleeping on ground; tents standing, still, as originally pitched.

Food badly cooked; some of the issues of inferior quality or in bad condition.

Service and quality of water poor; neglect of needed sedimentation or filtering or boiling; water vessels not properly cleaned.

Troops insufficiently employed as to work and recreation.

Camp police bad in respect of removal and destruction of kitchen and other waste, and of covering contents of privy vaults.

Medical officers insufficient in numbers and lacking in knowledge and practice of necessary sanitary measures, even in their application to the hospitals.

Nursing done by inexperienced soldiers either detailed from the companies or as members of the volunteer hospital corps.

A large number on sick report from disabilities existing prior to enlistment.

The following would probably have been prevailing: Diarrhea, typhoid fever, catarrhs of the respiratory tract and perhaps epidemic influenza, rheumatism and its complications, venereal diseases, measles, malarial fevers as a reappearance in those who had formerly suffered from them (it is possible that unusual conditions of the season which would greatly disturb the relationship between soil fermentation and vegetable growth, or that even an unconsidered way of ditching and drainage could lead to malarial fevers), continued (septic?) fevers not recognized as specific fevers and due to absorption of products of food decomposition in digestive tract.

If recent cases of typhoid fever had occurred, I would expect many more cases.

If measles had been found in camp, I would expect to find many more cases.

In considering even the best practicable ways for the betterment of camp hygiene, one may expect to meet with embarrassment of their execution by lack of authority and of means. Sanitary measures that are thought necessary and practicable should be demanded persistently and emphatically.

When it is remembered that aside from the present worth of a well soldier to the Government many of the cases of sickness will be the basis of pension claims, the enlarged obligations of those responsible should emphasize the need of sparing no means practicable for preventing sickness.

I would hope to improve so materially the health of the troops by removing or lessening the causes of sickness that by the last of August not more than 4 per cent of the command would be on sick report.

If I found that the soil in camp had been badly and hopelessly contaminated I would advise that the present site be abandoned and that new camps be established on new ground, say three-fourths of a mile up or down the river. In this event the old ground should be cleaned, trenches and pits filled up and earth packed in them, and all refuse buried, or burned, or carted away. If camp was not moved the tents should be struck and moved to new ground. Whether the company tents were arranged in one or in two lines, the intervals between tents on a line should be at least two feet more than the width of the tent. Once a week (after a day of fair weather) the tents should be shifted to their intervals and the old ground cleansed and left to freshen for its week. The tentage should be sufficient so that their occupancy should not exceed these limits: Common tent, 3 men; Sibley, 10 men; conical wall, 12 men; wall tents, 4 men. Shelter tents would not give good protection against the heavy rains, but their use, on the regulation allowance, would be much less harmful than the use of the allowance only of the larger tents. If enough tents are not obtainable to prevent crowding enough men could be withdrawn from them and placed under shelter tents. Except during inclement weather the tent walls should be raised and kept up all day for ventilation, and bedding and clothing should be taken out and aired for two hours. The large rainfalls and heavy dews would keep the tent ground damp, and the men would suffer if beds were made on the ground. To obviate this probably the most satisfactory way would be to floor each tent by placing sills of 4 by 4 inches on the ground, 2 feet apart, and running across tent, and laying inch planks on them. Such lumber could be delivered at about $10 per 1,000. Each soldier would require 30 feet at a cost of 30 cents. If the quartermaster's department could not furnish the lumber doubtless each company would supply its quota of the expense by subscriptions or from company fund. Facilities could easily be given to the men to buy straw for bedding. If purchased in lots by companies it should not cost more than $10 per ton or 10 cents for each soldier's share. Smoking in tents not to be allowed, nor chewing, unless the user provides his own receptacle for spitting. There will be heavy rainfalls of short duration. To carry off the surface water there should be a well-considered system of ditching for the camp as well as for the individual tents. A competent officer should be detailed in each brigade camp to lay out and direct the ditching. The ground should not be disturbed more than necessary and the excavated earth should be packed smooth and even.

The food of each company should be inspected daily by a medical officer and his investigation must not be confined to an examination of the food as cooked, but should be extended to the raw issues as to their quality, mode of issue, and facilities for keeping them. Cooked beans, left over, should not be kept over night, but thrown away,

as they are liable to ferment in a few hours in hot weather. The full allowance of canned tomatoes should be drawn, as they would be a healthful addition to the other more concentrated food, but they should not stand in cans that have been opened. Except in bread making, any man of average common sense, who is anxious to do well, ought to do camp cooking satisfactorily after a few days' trial. The Manual for Army Cooks, or its equivalent, should be in each company and the attention of the cook drawn to any defects in his cookery or care of food. Bread making, especially in camp, is entirely beyond the average company cook, who lacks the skill as well as the necessary facilities. As bread is the most important part of the ration, it is of importance that it should be wholesome and palatable. Camp bakeries should be established for each brigade, or soft bread issued if it was impracticable to make it in camp.

Privy vaults must be dug deep and narrow, supplied with board seats and such shelter of brush or canvas as will afford shelter from the weather as well as sufficient privacy, and yet allow ventilation. Once a day the designated detail should throw in a 6-inch layer of earth over contents. When within 3 feet of the top the pit should be filled in and mounded. Good walks to trenches ought to be made. Kitchen slops should be thrown into covered barrels and carted away daily to a safe distance and emptied on new ground. Kitchen or camp refuse to be burned or buried.

The troops should not be permitted to fall into indolent ways. The formal drills would be especially trying to these troops and might easily become excessive. Continuous occupation should be required for eight or ten hours daily and with as much diversity as practicable. Bodily cleanliness should be required. It is not likely that any stream would be used for bathing, but a tin basin, wash rag and towel would be in the reach of everyone.

Efforts should be made to keep prostitutes and gambling dens beyond reach of the soldiers. Canteens should be established.

The water for camp use is probably obtained from the Ohio. Better and more accessible water might be obtained from wells dug in safe places. The daily supply for each man should be at least 1 gallon for drinking and 5 gallons for all purposes. Cincinnati and Evansville take their water supply from the Ohio, and it is noted that these cities have only a moderate death rate from typhoid. If the water needs only removal of vegetable débris and earthy matter, this removal ought to be effected by some of the simpler methods of sedimentation or filtration; but if it held infective germs, nothing short of boiling or the use of scientifically constructed filters would be of much use.

MEDICAL DEPARTMENT OF THE NATIONAL GUARD.

No medical officer of the Army was on duty during the year with troops of the National Guard, but the meeting of the Association of Military Surgeons in Columbus, Ohio, afforded an opportunity to many of our medical officers of forming a professional and social acquaintance with delegates and others belonging to the medical staff of the National Guard of many of the States. Lieut. Col. W. E. Waters, deputy surgeon general, United States Army, Columbus Barracks, Ohio; Maj. Henry Lippincott, surgeon, United States Army, Fort Sheridan, Ill., and Capt. Robert J. Gibson, assistant surgeon, United States Army, Fort Thomas, Ky., were detailed to represent the Medical Department of the Army at the meeting. Major Lippincott made a full report of the proceedings, an abstract of which is here given.

The opening session was public and was held in High Street Theater at 10 a. m., May 25. The assemblage was very large and composed of surgeons of the Army, Navy, and National Guards in full uniform, together with many of the best citizens of Columbus and neighboring towns. Captain Pilcher, of the Army, a member of the local committee of arrangements, introduced the speakers, which he did in a graceful manner and with credit to himself and the Medical Corps of the Army.

Mayor Black, of Columbus, then delivered an address of welcome on behalf of the city, and referred in glowing terms to the work of military surgeons, and said there was no way of estimating how much suffering and pain could have been spared in wars of the past. He was glad that wars were becoming less and less frequent, and he was also glad that military surgery is making such advances along all lines. Through the intelligent work of the medical profession the horrors of those wars which must come will be considerably lessened.

The mayor was followed by the Hon. Asa S. Bushnell, governor of Ohio, who, in his speech, paid a generous tribute to military medical men.

The medical profession of Ohio was ably represented by Dr. Milliken, ex-president

of the Ohio State Medical Society. The Doctor spoke very highly of the work of the surgeons during the late war, giving great praise to those who risked their own for the lives of others. He paid high tribute to the advancement of military surgery, and emphasized his delight at the progress made by this society. He referred to the great Larrey in the most laudatory terms, saying that the work accomplished by that surgeon should be an example for all military medical men.

Adjutant-General Axline, referring to the the medical department of his own State, said there was no medical department in the National Guard of any State superior to that of the Ohio National Guard, which contains 225 officers and enlisted men. He mentioned the fact that great improvement had been made in the medical service of the guard. He asked that the society consider the importance of uniformity in the supplies of medical stores for the Army, Navy, and National Guards. General Axline's address impressed me with his great interest in the medical department of the State troops, and it is to be hoped that his good words found a responsive impulse in the hearts of all who heard him. The members of the medical department with whom I became acquainted certainly showed themselves worthy of holding commissions of a great State, and I am sure would give a good account of themselves if called into active service by the General Government.

Deputy Surg. Gen. W. S. Oliver, representing the British Army, was the next speaker. As he arose to address the large audience he was greeted with marked applause. He acknowledged great pleasure in being present and in wearing the badge of the Association of Military Surgeons. He referred to the military medical department of other countries, and said this Association of Military Surgeons was the only one of its kind he knew of, but was certain that England would follow the American example. He spoke of the people of the United States in a most friendly way; said it was a great honor to be with us, and his voice and manner indicated his heartfelt expressions.

Surg. Gen. Nicholas Senn, of Illinois, being called to the front of the stage, made a few remarks on the State of Ohio and referred in eloquent terms to some of her illustrious sons. In speaking of the association, which he founded, he said it was only 6 years old, but still it had done much good. He referred to the fact that at first the association was composed of the medical men of the National Guards of the country. The Army and Navy early sent representatives to the sessions of the association. Soon recognizing the value of the association, the representatives of the Army and Navy asked to become active members of the association. They were gladly accepted as members. In conclusion, General Senn spoke of the bright outlook for the association, saying the future was especially auspicious.

Medical Director Gihon, president of the association, was next introduced and delivered his presidential address, at the close of which he recommended the assignment of special subjects of inquiry to selected committees, and suggested as such special committees the following:

(1) On securing uniformity of organization of the medical department in the military establishments of the several States.

(2) On securing uniformity of outfit and supply for field service in the medical departments of the several States.

(3) On the rationing of bodies of men in peace and during hostile operations, on shore and afloat.

(4) On the institution of post exchanges (canteens) at all permanent posts and stations of the Army, Navy, Marine Corps, and National Guard.

(5) On the thorough disinfection of men-of-war, transports, and other Government vessels.

(6) On the best means of identification of enlisted men.

Major Moore, of the Ohio National Guard, followed, briefly reviewing the work of the committee of arrangements. The work done by the committee was enormous, and elicited the admiration of all members attending the meetings of the association.

Captain Pilcher having then read letters of regret from the President of the United States, the Secretaries of War and Navy, General Miles, General Sternberg, and Surgeon-General Tryon, the morning session was adjourned.

The second session, May 25, was held in the senate chamber and was called to order by President Gihon at 2 p. m. Uniform, undress.

The reports of officers and committees were then ordered.

The first read was that of the secretary, Major Burgin, of Philadelphia, who stated among other things that the membership of the association is now 460, an increase of 130 during the year. Major Burgin spoke of the high standing of the society, and said that the outlook was very promising. Major Carr, of Ohio, formerly treasurer of the association, gave an account of the financial transactions during his terms of office, and told of the difficulties and trials through which the association had passed.

Capt. James J. Erwin, Ohio National Guard, treasurer of the association, next submitted his report, and presented a certified check for $648.86, in order to show the successful status of the society, all bills having been paid.

Other reports were then rendered, and after the appointment of the nominating committee the following papers were read in full or by title: "A plea for the more efficient organization of the Medical Department on our ships of war," by Medical Inspector (Commander) John C. Wise, United States Navy, Washington, D. C.; "The work of the Medical Department on naval vessels," by Surg. (Lieut. Commander) C. A. Seigfried, United States Navy, Newport, R. I.; "The medical officer of the National Guard," by Lieut. Col. Leonard B. Almy, medical director (retired) Connecticut National Guard, Norwich, Conn.; "The hospital corps of the National Guard of Pennsylvania," by Maj. J. K. Weaver, surgeon, First Brigade, National Guard of Pennsylvania, Norristown, Pa.; "The hospital corps in Connecticut," by Maj. Julian La Pierre, surgeon, National Guard of Connecticut, Norwich, Conn.; "The Leadville campaign," by Col. Clayton Parkhill, surgeon-general National Guard of Colorado, Denver, Colo., and Maj. L. H. Kemble, surgeon, National Guard of Colorado, Aspen, Colo.; "The medical department of the Mexican national army," by Maj. Louis M. Maus, surgeon, United States Army, Washington, D. C.; "A military delegate to the Second Pan-American Medical Congress, Mexico, November, 1896" (read next day), by Col. Charles H. Alden, assistant surgeon-general, United States Army, Washington, D. C.; "Some suggestions as to the medical department of the National Guard," by Capt. Gilbert I. Cullen, assistant surgeon, Ohio National Guard, Cincinnati, Ohio.

The papers and the discussions on them were of great interest to all present. Commander Wise's paper was well received. He showed that the so-called humane element in the modern missile is erroneous and misleading, and said that the mortality in future wars will be decidedly increased and that from conditions obtaining in naval actions the casualties therein will be greater than in the operations of armies; that the large number of wounded men suffering from shock and hemorrhage will need immediate relief; that the organization of the Medical Department of the Navy, in its relation to the relief of the wounded, has made no advance commensurate with that of the instrumentalities of destruction, and that the detail for the relief of wounded in action must be organized as a permanent hospital corps.

Surgeon Seigfried's paper on "The work of the Medical Department on naval vessels" was read by Commander John C. Wise, United States Navy. This paper described the medical, surgical, and military duties of the Medical Department on ships of the United States Navy. It told of the diseases incident to life on board vessels, overcrowding, diet, etc., and the confinement consequent upon narrow limits. It was stated that autointoxication and infection were factors in the etiology of many of the common disorders met with; that the class of simple ephemeral fevers are almost wholly due to this cause. The paper referred to disease due to rapid changes of temperature tending to chronicity, discharge, etc.; skin diseases consequent upon handling certain materials; frequency of accidents, etc.; eye disorders due to excess of artificial light; vitiated air and tubercle; typhoid fever; vaccination, smallpox and venereal diseases. Reference was also made to malingering. The author discussed the military duties of the naval surgeon and referred to the equipment of the ambulance corps, the equipment of boats, and of the use of appliances for handling wounded on board ship. This paper covered enormous ground, and I must leave its further consideration for the editor of the Association of Military Surgeons.

Colonel Almy's paper, among other things, showed the difficulties which must be met by surgeons of State troops, the first and most important of these being due to the faulty method of appointment of State medical officers, which results injuriously, at least so far as responsibility is concerned.

I was particularly interested in the excellent showing made by Colonel Parkhill in his paper on the Leadville campaign. The hardships the men had undergone, and the very great privations they had cheerfully met, was, indeed, a noble lesson for older troops. Their devotion to duty was well told by Colonel Parkhill, and their small sick report was a splendid example of the result of discipline.

The third session, May 26, was also held in the senate chamber, and was opened at 10 a. m., President Gihon presiding. After the usual business formalities were disposed of, Surgeon Murray, on behalf of the United States Marine-Hospital Corps, raised the question of—

"Readmission into active membership of the National Association of Military Surgeons of that body, numbering 150 men. The corps was once on the active membership list. It was subsequently placed on the associate membership list. The members of it now want to be active members."

Some discussion followed, the tendency of which seemed to be in favor of readmission. The subject then, under a constitutional requirement, was laid over to be voted on at the next meeting.

The president then announced that reading of papers was in order, whereupon Colonel Alden, of the Army, read an article entitled "A military delegate to the Second Pan-American Medical Congress, Mexico, November, 1896." The author gave a full

account of the meeting in the City of Mexico, in 1896, and described places, persons, etc., and told of the great hospitality extended to the delegates. The address of Colonel Alden was made especially interesting by the circulation of photographs of prominent hospitals, medical officers, and also of President and Mrs. Diaz. These pictures were the cause of much favorable comment on the part of the members of the association. In concluding his address, Colonel Alden made a plea for closer relations between the United States and Mexico, assuring all that this would be of mutual advantage. This paper was a great treat to many of us who know little personally of the better Mexican people, and when published will be read with infinite pleasure.

The reading of other papers, either in full or by title, next followed. "Venereal disease in the Navy and its prevention," by P. A. Surg. (Lieut.) R. Percy Crandall, United States Navy, Norfolk, Va.; "The hygiene of enlisted men," by Maj. G. C. Ashmun, surgeon, Ohio National Guard, Cleveland, Ohio; "On military medical problems," by Lieut. Col. Alfred A. Woodhull, Medical Department, United States Army, Denver, Colo.; "Accouterments for the infantry soldier," by Deputy Surg. Gen. W. S. Oliver, British army medical department, Halifax, Nova Scotia; "The practical disinfection of ships of war," by Surg. (Lieut.) T. C. Craig, United States Navy, Brooklyn, N. Y.; "Some practical points on antisepsis in the Navy, embracing hygiene and disinfection of ships, barracks, and yards, with a view to preventing the importation of germs of disease and the spread of contagious affections," by Medical Director (Capt.) G. W. Woods, United States Navy, Mare Island, Cal.; "Camp sanitation in the National Guard," by Capt. James J. Erwin, assistant surgeon, Ohio National Guard, Cleveland, Ohio; "Some remarks on mountain campaigning from a medical standpoint," by Capt. Henry P. Birmingham, assistant surgeon, United States Army, Fort Trumbull, Conn.; "The adoption of an emergency ration for the National Guard," by Maj. Thomas J. Sullivan, surgeon, Illinois National Guard, Chicago, Ill.

In the absence of Colonel Woodhull, Captain Pilcher read a great portion of the Colonel's paper on "Military medical problems," which dealt chiefly with measures having in view the prevention of disease and the avoidance of confusion and suffering in the field.

Deputy Surgeon-General Oliver, of the British army, exhibited and explained his "Accouterments for the infantry soldier." The president of the association, Commodore Gihon, made a motion, which was carried, that Surgeon-General Oliver be requested to write a paper on the subject assigned him on the programme, and that it be incorporated in the record of the transactions of the seventh annual convention of the National Association of Military Surgeons, as if it had been read before the convention. Another motion was made and carried, that his article be illustrated fully. The English delegate was informed that the cost of illustrating the paper will be assumed by the association. It will be one of the most valuable contributions to the literature of military surgery when completed. A vote of thanks was tendered General Oliver before he retired.

Captain Erwin's paper on "Camp sanitation in the National Guard" was heard with marked attention. He painted one camp in rather dismal colors, and demonstrated the necessity of placing camp sanitation under competent medical officers. The discussion on this paper was quite full and will doubtless bring good results.

Fourth session, 2 p. m., May 26, senate chamber. "Disability discharge in the United States Army," by Col. Dallas Bache, assistant surgeon-general, United States Army, Omaha, Nebr.; "Identification," by Maj. George W. Adair, surgeon, United States Army, Washington Barracks, D. C.; "Objections to the system of identification in use in the United States Army," by Maj. Paul R. Brown, surgeon, United States Army, Fort Hamilton, N. Y.; "A field appliance for the extempore preparation of hypodermic solutions," by Maj. Henry McI. W. Moore, surgeon, Ohio National Guard, Columbus, Ohio; "The better type of medical officer," by Lieut. Col. Alfred A. Woodhull, Medical Department, United States Army, Denver, Colo.; "The use of kola in military practice," by Col. George H. Penrose, surgeon-general Utah National Guard, Salt Lake City, Utah; "Degeneration in military life," by Capt. Charles E. Woodruff, assistant surgeon, United States Army, Fort Sheridan, Ill.; "Regimental instruction in first aid," by Surg. Capt. Rory Fletcher, Eighth V. B. King's Royal Rifles, London, England; "Personal equipment for field service," by Lieut. Col. Henry R. Tilton, deputy surgeon-general, United States Army, St. Paul, Minn.; "First aid on the firing line," by Capt. James J. Erwin, assistant surgeon, Ohio National Guard, Cleveland, Ohio.

Few papers were read at this session, but all noted in the foregoing list were read by title, if not in full.

Major Adair's article, "Identification," elicited much discussion, but I doubt that it made any converts to the system he proposed. The present system seems to hold its ground, so far as I could determine, as I believe it will as long as any method thus far made public.

Major Moore, of the Ohio National Guard, exhibited a simple and convenient appliance for extempore preparation of hypodermic solutions. The chief merit claimed for it was sterilization, which could be secured under all circumstances.

Fifth session, 9.30 a. m., May 27, senate chamber. The meeting having been called to order and the opening business completed, the report of the nominating committee was announced and confirmed.

The officers elected for the coming year are: President, Brig. Gen. (Retired) Jefferson D. Griffith, surgeon-general National Guard of Missouri, Kansas City, Mo.; first vice-president, Maj. John Van Rensselaer Hoff, surgeon, United States Army; second vice-president, Commander John C. Wise, medical inspector, United States Navy; treasurer, Maj. James J. Erwin, assistant surgeon-general Ohio National Guard; secretary, Capt. James E. Pilcher, assistant surgeon, United States Army. Kansas City was selected as the place for the 1898 meeting. The following list of papers was then submitted: "The radical cure of inguinal hernia from the standpoint of the military surgeon," by Maj. John M. Banister, surgeon, United States Army, Fort Leavenworth, Kans.; "On fracture of the lower extremity of the radius in its general and military aspects," by Dr. Lewis Stephen Pilcher, formerly passed assistant surgeon, United States Navy, Brooklyn, N. Y.; "Slowly absorbable catgut by a modification of the Boeckman method," by Capt. W. C. Borden, assistant surgeon, United States Army, Fort Snelling, Minn.; "The ambulant treatment of fractures," by Maj. Edward Martin, surgeon, National Guard of Pennsylvania, Philadelphia, Pa.; "On the management of acute or sudden recurrent appendicitis in camp and in the field," by Brig. Gen. M. O. Terry, surgeon-general, National Guard of State of New York, Utica, N. Y.; "Some effects of bullets with stereopticon illustrations," by Brig. Gen. (Retired) Jefferson D. Griffith, surgeon-general, Missouri National Guard, Kansas City, Mo.; "The place of military medicine and surgery in the medical college curriculum," by Dr. George M. Kober, professor of military surgery in the Georgetown University Medical School, Washington, D. C. General Griffith, Missouri National Guard, gave a most instructive lecture on "Some effects of bullets," illustrated by large pictures thrown upon a screen by a stereopticon. A number of bones and skulls were exhibited, showing the effects of bullets, together with photos of the tests made by shooting bullets into human bodies at different distances. This work showed great ingenuity and perseverance, and demonstrated the destructive effects of the service rifle as well as of larger missiles. General Griffith's experiments were made at Fort Riley last year. The pictures (stereopticon views) of the destructive effects of shrapnel fired at horses were very interesting, As illustrating the great destructiveness of the service rifle, he presented 64 fragments of bone the result of one shot fired at a skull in the recent state. This paper will be read with interest when it appears in the annual proceedings. At the conclusion of General Griffith's paper the association adjourned to meet at the Starling Medical College.

The association having met at the Starling Medical College, Colonel Alden, in the absence of Maj. John M. Banister, presented three cases upon whom Major Banister had operated successfully for the radical cure of inguinal hernia, and spoke of the excellent work done by others in the same field. Dr. L. S. Pilcher read a paper on fracture of the lower extremity of the radius and showed plates and recent specimens illustrating this fracture. Other papers were to have been read at this meeting, but were deferred.

Sixth session, Columbus Barracks, 2 p. m., May 27. From 1 to 2 p. m. the United States Army Battalion Field Hospital was on exhibition, giving demonstrations of the drill of the hospital corps and company bearers. "The lines of surgical aid on the battlefield, as modified by modern military conditions," by Capt. James E. Pilcher, assistant surgeon, United States Army, Columbus Barracks, Ohio; "Military sanitary organization on the lines of communication and at the base," by Maj. John Van Rensselaer Hoff, surgeon, United States Army, Vancouver Barracks, Wash.; "A new method of lifting and carrying a patient by a single bearer," by Maj. Henry McI. W. Moore, surgeon, Ohio National Guard, Columbus, Ohio; "A medical chest suitable for a battery, troop, or independent company," by Lieut. Herbert A. Arnold, assistant surgeon, Battery A, National Guard of Pennsylvania, Ardmore, Pa.; "A portable folding general operating table for use on naval vessels," by Surg. (Lieut. Commander) C. A. Seigfried, United States Navy, Newport, R. I.; "The physique of the American soldier," by Maj. Henry S. Kilbourne, surgeon, United States Army, Madison Barracks, N. Y.; "Physical training in our Army and Navy," by Surg. (Lieut.) Henry G. Beyer, United States Navy, Washington, D. C.; "Physical training in the National Guard," by Capt. William Alfred Westervelt, assistant surgeon, Ohio National Guard, Columbus, Ohio; "What to avoid in army athletics," by Lieut. John S. Kulp, assistant surgeon, United States Army, Vancouver Barracks, Wash.; "The soldier as an athlete," by Lieut. Guy C. M. Godfrey, assistant surgeon, United States Army, St. Paul, Minn.

The field hospital was creditably arranged and was an excellent object lesson for many of the surgeons. Here were displayed all the appliances necessary for the proper management of a battalion "field hospital." In it also were shown some new med-

ical and surgical chests—improvements on those now in use in the Army—in that the cases are constructed of galvanized iron and the vials are made of hard rubber instead of glass. A bicycle ambulance also on exhibition attracted attention and was indeed a wonderfully ingenious contrivance.

The drill of hospital corps and company bearers was good and showed that the medical department of Columbus Barracks is alive to the Surgeon-General's requirements. I was especially well pleased with Captain Pilcher's one-bearer drill. This did not deviate from the authorized manual, but the work was done by the entire corps and company bearers at the same time and was very interesting. I have since adopted his method here and find the men take to it kindly.

Major Moore's method of lifting and carrying a patient by a single bearer was demonstrated by himself. He caused the bearer to kneel on one knee on which the patient sits. As the bearer rises he lifts the patient, left arm being under the thighs, right arm around the back. I have tried this method here and must say that I consider it a great improvement on our corresponding manner of lifting the patient.

Lieutenant Arnold, assistant surgeon, National Guard of Pennsylvania, exhibited a small and convenient medical chest for a battery, troop, or single company. This was a very ingenious and useful chest, and contained the articles most likely to be needed on a scout or on any detached duty of limited duration.

Captain Westervelt, assistant surgeon, read a paper on "Physical training in the National Guard." This young officer showed commendable zeal in his work, and his instructive paper was a splendid reflex of what is now being done by the volunteers. The other papers were, as my memory serves me, read by title.

I have tried to give a fair outline of what I saw and heard at the meetings of the Association of Military Surgeons, and regret that I am unable to write a better account of them. I wish to say that I am aware of the great good the society is doing, that I regard it as a high compliment that I was selected to attend the meetings officially, and that I believe this association is destined to become of the greatest value to the Government and country, and that it should be acknowledged and cherished by National and State authorities alike. I desire to state that my observations at the meetings have led me to believe that the United States has, in the corps of volunteer surgeons, at this time a body of medical officers who, as a whole, are thoroughly competent to take the field and perform every duty in a manner that would reflect a high degree of excellence.

It is my duty now to refer to the social manifestations incident to our gathering in Columbus, and here I must mention the reception given the society by His Excellency Governor Bushnell of Ohio at his residence on the night of May 25. The officers were in full uniform and had the pleasure of meeting many of the best people of Columbus and vicinity. The Governor and his wife were exceedingly affable, and made one and all feel they had not only a cordial welcome to Ohio, but to their home as well. This was emphasized by the brilliancy of the mansion, as well as by everything else which contributed to make the event enjoyable and impressive.

On the night of May 26, Colonel and Mrs. Poland and the officers and ladies of Columbus Barracks gave a reception to the association at the post. This also was an extremely agreeable diversion which brought the volunteers and regulars into friendly and desirable relationship, and demonstrated that each should be proud of the other.

The Columbus Academy of Medicine entertained the association at the Columbus Club on the night of the 27th, and, although I did not attend, having left the city that night, I was informed by others that it too was in keeping with all the other handsome things the good people of the city did for our society.

SECOND PAN-AMERICAN MEDICAL CONGRESS.

The second Pan-American Medical Congress was held in the City of Mexico, November 16–19, 1896. Col. Charles H. Alden, assistant surgeon-general, and Maj. Calvin De Witt, surgeon, attended the meeting as delegates from the Medical Department of the Army. Colonel Alden's report, submitted below, gives a general view of the proceedings of this important medical congress and of the advantages derived from it. He pays a graceful tribute to the high standard of the medical profession in Mexico and makes brief but suggestive mention of the great sanitary improvements in progress and of the excellent condition and advanced equipment of its hospitals, schools, laboratories, etc.

I have the honor to report that in compliance with Special Orders 236, Headquarters of the Army, current series, I attended the Second Pan-American Medical Congress held in the City of Mexico, November 16–19, 1896, leaving this city on the 10th

of November. Surg. Calvin De Witt, United States Army, the other delegate from the Medical Department of the Army, joined me in San Antonio, and we reached the City of Mexico on the 15th.

The Congress was formally opened on the night of November 16 at the "Teatro Nacional," or National Theater, when the President of the Republic, Gen. Porfirio Diaz, made a most cordial and graceful address of welcome. He was followed by Dr. Liceaga, secretary of the Congress, Dr. Carmona y Valle, the president, and Señor Gamboa of the board of health of the federal district. Dr. William Pepper, of Philadelphia, who was the first president of the Pan-American Medical Congress, and is regarded as one of its founders, made the closing address and was most warmly received. The tasteful decorations, the exquisite music, and the large audience, nearly 3,000, including many ladies, contributed to make the occasion a brilliant and most interesting one.

The second general meeting of the Congress was held on Tuesday night the 17th, in the Chamber of Deputies, when interesting addresses were delivered by Dr. Fernandez, of Havana, on "Yellow fever;" by Dr. La Chappelle, of Canada, on "Pasteur and his discoveries;" one by Dr. Walter Wyman, Supervising Surgeon-General of the Marine-Hospital Service, on "Quarantine," in which he ably discussed international obligations from a sanitary point of view, and one by Dr. La Vista, of Mexico, on "Therapeutics."

The third and closing general session, held in the same place, was devoted chiefly to the presentation of reports and to brief addresses from the representatives of the nationalities represented at the congress, who returned thanks for the courtesies extended by the Government and people of Mexico.

It appears from the treasurer's report that 445 delegates and members had registered; about 200 from Mexico itself, about 200 from the United States, and the remainder from other nationalities in the Western Hemisphere, including Canada, the West India Islands, and the Republics of Central and South America. No list of physicians actually present at the congress was published, but there was a good representation of the best element of the profession in all the countries referred to. That this number did not embrace more of the prominent physicians and surgeons of this country was no doubt due to the fact that at this season our medical colleges are in session, and many notable men, who are teachers, could not spare the time for so long a journey. Among the attendants upon this congress were quite a number of lady physicians from the United States.

The principal scientific work of the congress was done not at the general sessions but at the meetings of the many sections into which the congress was divided. There were fifteen of these sections, the most important being those of general medicine, general surgery, obstetrics and abdominal surgery, and hygiene, the others representing all the more important specialties in medicine, and including one of military and naval surgery. All the sections, except a few minor ones, met in the National School of Engineers, a large building with central court affording ample and convenient accommodations. The principal sections, those of general medicine, of general surgery, of obstetrics and abdominal surgery, and of hygiene, held meetings twice daily during the congress and were well attended. The less important sections held fewer meetings, and some of them had so little business and so small an attendance that their separate organization seemed hardly needed.

Although the novel and interesting sights of the beautiful City of Mexico, particularly attractive at this season, naturally diverted the attention of foreign members, great interest was shown in the proceedings of the congress, and the contributions to medical science were numerous and important. According to the published official list there were 340 papers presented at the general or section meetings, though but a part were actually read. It was, of course, impossible for one person to do more than attend the general sessions and to listen to a few of the papers read at the sections, so that only an outline of the work done can be given.

In the section of general medicine the subjects of malarial and yellow fevers claimed much attention. There were twenty papers on these and allied subjects. Among them were articles on "The urine in yellow fever," by Dr. Casabo and by Drs. Acosta and Davalos, of Havana; one on "The biological character of the blood of yellow fever," by Dr. Coronado, of Havana, specially interesting as confirming at this time the conclusions of Surgeon, now General, Sternberg in his investigations in 1888–89, and others by Brazilian and Venezuelan physicians.

In surgery many papers were presented, covering the field pretty generally, and including the interesting subjects of abdominal surgery, the radical cure of hernia, cerebral surgery, and Roentgen rays as an aid in diagnosis. Surgical operations were performed before the section at some of the city hospitals.

The section of hygiene, demography, and allied subjects was an important one, and the papers were numerous and interesting as illustrating the varying conditions existing in the different nationalities represented. Quarantine and public health in its international relations naturally came in for much discussion.

Under the direction of the international executive commission, a body made up of representatives of the various nationalities and which had in special charge the business arrangements of the congress, three important special commissions were appointed—one on "Public health, quarantine, and medical legislation," Dr. E. Liceaga, of Mexico, chairman; another on a "Pan-American pharmacopœia," Prof. J. P. Remington, of Philadelphia, chairman; and a third on the "Pan-American medicinal flora," Dr. H. H. Rusby, of New York, chairman. These special commissions were charged with the consideration of the important subjects assigned them during the interval between this and the next congress, to which they are to make their report.

Upon the invitation of the delegate from Venezuela, the international commission selected Caracas, the capital of that Republic, as the place of the next meeting in December, 1899.

My own contribution to the work of the congress was a paper on "Examinations in medicine, an inquiry into their effects on education, and the best methods of conducting them," read before the section on medical education, and one on "Recent improvements in the equipment of the United States Hospital Corps," presented at the section of military and naval surgery, of which section I had the honor of being made one of the honorary presidents.

This meeting of the Pan-American Congress in the City of Mexico will be especially remembered by the delegates and members from other countries for the generous and gracious hospitality extended to them. It is impossible in this report to give an adequate idea of the magnificence of the public entertainments, and of the attentions showered upon the visitors by both government officials and private individuals. The arrangements made for the pleasure and comfort of guests were not only extensive and elaborate in the planning but most successfully carried out. The traditional courtesy of the Mexican nation exceeded itself on this occasion.

The notable opening of the congress by the President of the Republic at the Teatro Nacional has been referred to. On Wednesday, the 18th, there was a reception by the governor and municipality of the City of Mexico at the National Palace. Not only was this in itself a brilliant occasion, but the Cathedral and the Plaza Mayor, upon which the palace fronts, were illuminated, and there was a grand display of fireworks in the square. The central court or "patio" of the palace was transformed into a fairy grotto and used as the supper room. The next day, Thursday, the 19th, was the principal social event, the reception by the President and Mrs. Diaz at the Castle of Chapultepec. The castle or palace, situated on a hill overlooking the valley of Mexico, with its snow-clad mountains in the distance and approached by the fine boulevard of the Paseo de la Reforma, was in itself a great attraction. The gracious greeting of the distinguished President of the nation and his charming wife, the delightful music, and generous entertainment combined to make this a memorable event. An elaborate ball by the Jockey Club of the City of Mexico was the last great festivity of the week.

A number of interesting and instructive excursions took place during the intervals of or after the daily meetings of the congress. The most important only can be enumerated. Special trains on the street railway or steam lines were provided in all cases, and a generous luncheon when needed. On Tuesday the new slaughter-houses in the suburbs of the city, completed but not yet occupied, were visited. They are on a very extensive scale and equal in their appointments to the best anywhere. On Wednesday the guests were taken to the new general hospital, now under construction, destined to be a large establishment of some 35 buildings with the most approved modern arrangements, and to the new penitentiary, a model building of its kind, both several miles from the city. On the 20th, after the close of the congress, there was an all-day excursion to the drainage works of the valley of Mexico and the great tunnel connected with them. This colossal and most interesting undertaking, practically complete but not yet fully utilized, is destined, when connected with the improved sewerage system of the city, to remedy the one great defect now existing in its sanitary condition. On Saturday the visitors were taken by rail to the ruins of San Juan Teotihuacan where, after inspecting the pyramids and other interesting monuments, they were hospitably entertained by the governor of the State of Mexico, within whose jurisdiction they were.

The City of Mexico contains many institutions of interest to medical men, most of which I visited. The principal are briefly as follows: The National Medical College, at which a reception was held on the night of the 15th; the Pathological Institute; the offices of the supreme board of health and its well-equipped laboratories; the National Medical Institute, devoted to the collection, cultivation, study, analysis, etc., of the medical flora of the country, and the Regina, Jesus, San Hipolito, San Andres, Juarez, and American hospitals. The Military Hospital of Instruction, through which I was shown by the courtesy of Colonel Lopez, the director, I found in admirable order, the operating room being particularly complete in its appointments and fully up to the requirements of modern antiseptic surgery.

I was most cordially received by the officers of the congress—Dr. Carmona y Valle, the president; Dr. Liceaga, the secretary; Dr. La Vista, and others, and by the head of the national medical service, General Cacho. The sending of delegates from the Army, Navy, and Marine-Hospital services by the United States Government was highly appreciated. The delegates are under special obligations to Captain Dwyer, military attaché at the United States legation, who placed his carriage at our disposal and contributed much to the success and pleasure of our visit. Our thanks are also due to Maj. Federico Abrego, professor in the military medical school, for many kind attentions.

The success of such a meeting as the Pan-American Congress is not to be measured by the number or character of the papers on general professional topics presented. It is in the increased stimulus given to the study of diseases likely to spread from one nation to another, of the means of prevention, of the obligations of international hygiene and quarantine, that its importance lies. Climatology and the medical flora of the countries concerned also receive increased attention. Much benefit arises from the interchange of ideas, the examination of methods of medical education and practice other than those existing in one's own country.

The members of the congress from the United States could not fail to be impressed with the high standard of the profession of medicine in Mexico, a fact which possibly some had not fully understood. It is simple fact, not the language of compliment, that the improvements in the sanitary and reformatory institutions in the hospitals and schools in the city already made or in progress under the present enlightened head of the Republic, guided by scientific advisers of the highest character, place Mexico fully abreast with the most advanced nations of the world. This wonderful progress is more striking from the fact that it has been so rapid in its development that old conditions have not yet entirely passed away.

UNIFORMITY IN MEDICO-MILITARY STATISTICS.

Embodied in this report are the data concerning recruiting and the movements of sick in our Army, tabulated on the forms suggested by the International Commission of Military Medical Officers, which met at Budapest in September, 1894. It was reported to this office that at that meeting the decision was made to begin publication of Army medical statistics on the international forms with the data of the calendar year 1895. In my annual report for the year ended June 30, 1895, I submitted the statistics of the calendar year 1894 on the international forms, and in the following year the statistics of the calendar year 1895. Copies of these reports were sent to each of the members of the commission and to the chiefs of the Army medical departments represented at the meeting at Budapest.

HEALTH OF THE ARMY.

The health of the Army has been excellent during the calendar year 1896, the medical statistics of which are embodied in the present report. In the previous year all the rates that are usually considered by statisticians and health officers as throwing light on the physical condition of a community were lower than in any former year of the history of our Army. Practically the rates of 1895 and 1896 are the same, but when accurate expression is given to them in figures, those of 1895 continue to be the standard of comparison as the lowest recorded rates.

The admissions to sick report per thousand of strength were 1,110.39, as compared with 1,110.22 in the previous year, and with 1,089.73 in 1894, which was the lowest recorded admission rate for all causes; but it is to be observed that an excess of injuries in the past two years raised the total rate, while the admission rate for disease in both years was lower than in 1894—830.65 during the past year, 837.53 in 1895, and 845.52 in 1894. The average length of time each case was under treatment was 11.19 days, as compared with 11.14 in 1895 and 11.69 as the average of the previous decade. The number of days lost on account

of sickness for each man in the Army was 12.43 days, as compared with 12.37 in the previous year and 14.93 the average of the previous decade. The number constantly noneffective per thousand of strength was 33.97, as compared with 33.89 in 1895. The noneffective rate during the decade prior to 1895 averaged 40.92 per thousand of strength. The discharge rate for disability was 10.15 per thousand of strength, as against 9.15 in the previous year; but that the lessened nonefficiency of recent years does not result from discharging men for disability is easily recognized when we observe that the discharge rate of the decade prior to 1895 was 21.77 per thousand of strength. In those ten years a higher nonefficient rate prevailed notwithstanding the considerably larger number of men discharged from the ranks on account of persisting disability.

The absolute number of discharges was 276. Injury was the cause in 55 cases; disease in 221 cases. Sixteen of the cases due to injury were ruptures for which the men declined operation; 10 were the result of gunshot wounds. Of the discharges due to disease, 34 were occasioned by tuberculosis of the lungs, 27 by rheumatism and myalgia, 24 by disease of the heart, and 13 each by diseases of the eye and ear. The largest number discharged from any one post was 12 from Fort Thomas, Ky., equal to a rate of 24.84 per thousand of strength; but larger rates than this were reported from three other posts—26.95 given by 10 discharges at Fort Clark, Tex.; 27.21 by 8 at Fort Grant, Ariz., and 38.10 by 8 at Whipple Barracks, Ariz. Besides these discharges, there were 118 men discharged in accordance with the provisions of section 3, paragraph 140, Army Regulations, for disability contracted before enlistment, or by misconduct or bad habits; 51 of these discharges were on account of venereal diseases.

The death rate from all causes constituted 5.44 per thousand of the strength—not much higher than that of the previous year, and much lower than the average annual rate, 7.51, of the previous ten years. The corresponding rates from disease were 3.83, 3.55, and 5.10; from injury, 1.62, 1.61, and 2.41. The absolute number of deaths was 148, of which 44 were results of injury and 104 of disease. Typhoid fever caused 17 of these deaths; disease of the heart, 13; pneumonia, 9; disease of the kidneys, 8; alcoholism, 7; tuberculosis of the lungs, 6; gunshot injuries, 14, and fractures not gunshot, 7. The largest number of deaths at any one post was 10 at Fort Sam Houston, Tex., giving a death rate of 15.48 per thousand of strength; but leaving arsenals and small posts out of consideration, the largest death rates were 23.81, caused by 3 deaths at Fort Ringgold, Tex., 18.47 by 7 deaths at Fort Robinson, Nebr., and 17.39 by 6 deaths at Jefferson Barracks, Mo.

It may be well to notice the great improvement that has taken place in the past few years in the sanitary condition of the colored troops as manifested by their lessened rates of sickness, disability, and death. The white troops have participated in the improvement, although their rates have not fallen so rapidly as those of the colored men. There was no doubt greater room for improvement in the sanitary status of the colored troops, and the men may have responded with more earnestness to efforts in this direction. During the past year the total admission rate for all causes among the colored troops was 868.88 per thousand of strength, as compared with 1,132.49 among the whites for the same year, and as compared with 915.88 among themselves in the previous year, and with 1,368.64 their own annual average for the previous decade, the annual average of the white troops having been 1,284.95. The nonefficiency from all causes among the colored troops

during the year was 25.75 per thousand of strength, as compared with 34.72 among the white troops. The colored soldier lost 9.42 days from disability during the year, the white soldier 12.71; and the average time of treatment of each case was among the colored troops, 10.82 days; among the whites, 11.22 days. The causes of disability from which the colored men suffered less than the white troops were malarial fevers, venereal diseases, alcoholism, diarrhea, and injuries; those from which they suffered more were neuralgia, rheumatism and myalgia, tonsillitis, colic and constipation, conjunctivitis, and pneumonia.

HEALTH OF THE MILITARY DEPARTMENTS.

The admission rate varied in the different military departments from 1,246.37 per thousand of strength in the Department of the East to 762.18 in the Department of California. It was above the army average in the Departments of the East, Texas, the Platte, the Colorado and the Missouri; but this was offset by lessened rates in the Departments of the Columbia, Dakota, and California.

The rate of nonefficiency, or constant disability, was above the army average of 33.97 per thousand of strength in three of the departments—the Missouri, Texas, and the Platte; but the highest rate, that of the Department of the Missouri, was only 37.23. The rates in the Departments of the East and the Colorado were below the average, but above 3 per cent of each command. Those of the Departments of Dakota, the Columbia, and California were below 3 per cent, that of California, the lowest, being only 24.02 per thousand of strength.

The death rate in the Department of Texas, 9.28 per thousand of strength, was considerably higher than the average of the Army, 5.44. This rate in the Departments of the Missouri, the Colorado, and the Platte was slightly above the average, while in the Departments of Dakota, the East, California, and the Columbia it was below the average, the rate of the last-mentioned department being only 2.01 per thousand of strength.

The rates of discharge for disability varied from 12.29 per thousand of strength in the Department of Dakota to 7.15 in the Department of California, as compared with the army average of 10.15. In three of the other departments—Texas, the Colorado, and the Missouri—the rates were above the average. In the Departments of the Platte, the East, and Columbia they were below the average.

Considering all the rates for the calendar year, the Department of Texas had probably the worst record and the Department of California the best record among the military departments.

DEPARTMENT OF THE EAST.

This department had a mean strength of 7,980, all white troops; an admission rate of 1,246.37, a nonefficiency rate of 33.65, a death rate of 4.89, and a discharge rate of 8.27. These rates are practically the same as those of the previous year and differ from the army average only in having the admission rate somewhat in excess. In 1895 this excess was due to an increased prevalence of malarial fevers in the department. The excess in 1896 was due to a similar cause, the admission rate for malarial fevers having been 175.18 in the department, as compared with 83.08 in the Army generally. Diarrheal diseases also were somewhat more prevalent in this department than in the Army as a whole.

The posts which contributed materially to the excess of admissions

in this department, as compared with the average rate for the Army, were Washington Barracks, D. C., Fort Myer, Va., and Fort Slocum, N. Y., which showed, respectively, rates of 2,250.71, 2,250, and 1,680.41 per thousand of strength. But, although the admission rates were thus high, the rates of constant sickness were higher at certain other posts, as at Fort Barrancas, Fla., Fort Thomas, Ky., and Fort Monroe, Va., where these rates were, respectively, 53.30, 50.64, and 44.70, although the admission rate at each of these was considerably lower than at Fort Slocum. At Washington Barracks the excess of admissions was caused chiefly by malarial infections, 1,071.22, as against the army rate of 83.08; venereal diseases, 136.75, as against 78.08, and boils and abscesses, 122.51, as against 42; its rate for injuries was smaller than the average. In 1895 Fort Myer had the largest sick rates of any post not only in the department but in the Army. During the past year its rates fell considerably, so as to be a little below those of Washington Barracks. Its excess of admissions was due to malarial fevers, injuries, bronchitis, and venereal diseases; but the malarial cases were equivalent to only 644.37 per thousand of strength as compared with 1,092.59 in the previous year, and its rate of constant sickness from this infection was reduced from 14.07 to 5.83 per thousand. This lessened prevalence of malarial cases was the chief factor in the improved condition of this post during the past year.

The large admission rate at Fort Slocum was due mainly to malarial fevers and injuries, with a small excess contributed by alcoholism and vaccinia. The rate for venereal diseases at this post was small—30.93 per thousand, as compared with the army rate of 78.08. At Fort Barrancas the large rate of nonefficiency was due to a slightly prolonged duration of cases generally, and particularly to the occurrence of 3 cases of typhoid fever, an increased number of diarrheal cases, while injuries caused a rate of 12.44 constantly disabled, as compared with the army rate of 8.73. At Fort Thomas the large rate of constant sickness was the result of a greater prevalence of vaccinia, tonsillitis, rheumatism, myalgia, and venereal diseases, the last having occasioned a rate of 11.82, as compared with the army rate of 5.26 daily sick out of every thousand men present. At this post there were 12 discharges and 3 deaths during the year. At Fort Monroe the larger rate of constant sickness was caused by a slight increase in the rates of malarial fevers, vaccinia, tonsillitis, diarrhea, and injuries. Fort McPherson, Ga., had an admission rate no larger than the army average, but its nonefficiency was high, 40.86 per thousand, with 8 discharges and 6 deaths.

The record of Columbus Barracks, Ohio, for the year 1896 is a great improvement on that of the previous year, its admission rate having become reduced from 1,418.32 to 1,200.85 and its constant sickness from 60.65 to 42.20. If the lessened prevalence of sickness be taken as an index of sanitary conditions, these have undergone much improvement at Fort Hamilton, N. Y., during the past few years. In 1892 this post had the largest admission rate of any post in the Army. Its high rates led to an investigation into the conditions causing them. In 1893 the rates continued high, but since then they have been nearer the average, and during the past year the admission rate has been reduced to 1,097.01 and the constant sickness to 29.63.

Excluding from consideration arsenals and small garrisons of less than 100 men, the post in this department which gave the best medical record during the past year was Fort Porter, N. Y., which had the small admission rate of 486.96 and only 21.72 daily sick per thousand of strength, and this notwithstanding the fact that its admissions for venereal

diseases were fully up to the army average. The admissions at Fort Wadsworth, N. Y., equaled 885.57 per thousand, but its rate of nonefficiency was 28.83. Malarial affections were considerably in excess of the army average at this post; they constituted more than one-fourth of the total admissions. Plattsburg Barracks, N. Y., had a rate of constant sickness equal to 22.99 per thousand of strength, with an admission rate of 955.51, and Jackson Barracks, La., had corresponding rates of 25.40 and 944.83. The rate of nonefficiency at Fort Adams, R. I., slightly exceeded 3 per cent—31.60 per thousand—with an admission rate of 943.86.

DEPARTMENT OF THE MISSOURI.

Reported strength, 4,298. Admission rate, 1,158.68; constant sickness, 37.23; discharge for disability, 10.93; death rate, 6.28. These rates differ from the average rates of the Army only in having the constant sickness somewhat in excess. This was occasioned largely by injuries and venereal diseases and slightly by an increased prevalence of malarial infections and typhoid fever.

Jefferson Barracks, Mo., and Fort Riley, Kans., had large admission rates, 1,573.91 and 1,592.01, respectively, but the constant sickness at the former post, 67.23, was much greater than at the latter, 44.13, per thousand of strength. The large admission rate at Jefferson Barracks was due to malarial and venereal diseases, with a slight increase in the frequency of injuries. The malarial admission rate amounted to 356.52, as compared with the army rate of 83.08 per thousand of strength, and the venereal rate to 211.59, as compared with 78.08. The high rate of constant sickness was mainly occasioned by the malarial cases, which caused a daily sick rate of 16.05 per thousand of strength, a rate ten times greater than the average rate of the Army, 1.65. The venereal cases added materially to the daily sickness, 14.53, as compared with the army average of 5.26. Typhoid fever, of which there were 10 cases, 3 fatal, and the excess of injuries also contributed to the high rate of nonefficiency at this post. Six discharges for disability and 6 deaths occurred during the year. The large admission rate at Fort Riley was due in part to an increased prevalence of venereal diseases, rheumatism, and myalgia, but chiefly to injuries, the rate for which amounted to 601.69 per thousand of strength, or considerably more than the admission rate for all diseases and injuries at Fort Wayne, Mich. Eleven discharges for disability, 4 of which were occasioned by injury, and 3 deaths, 2 of which were caused by injury, were reported from this post during the year. Fort Leavenworth, Kans., and Fort Brady, Mich., had their noneffective rates, 39.46 and 38.08, respectively, somewhat above the average, but while the admission rate of the one was no higher than the army rate, that of the other was considerably lower. At Fort Sheridan, Ill., and Fort Sill, Okla., the rates differed little from the average; at Fort Reno, Okla., they were low—admissions, 877.84, and noneffective, 28.93, per thousand of strength. Fort Wayne, Mich., had the best record in the department—568 admissions and 20.85 daily sick per thousand of strength.

DEPARTMENT OF DAKOTA.

Reported strength, 2,442. Admission rate, 782.15; rate of constant sickness, 29.50; discharge rate, 12.29; death rate, 4.91. Only one post in this department, Fort Yates, N. Dak., had an admission rate larger than the army average, 1,214.95, as compared with 1,110.39 per thousand

of strength; and only two, Fort Yates, N. Dak., and Fort Snelling, Minn., had their rates of noneficiency above the average, 44.50 and 43.05, respectively, as compared with 33.97. The admission rate at Fort Snelling was only 1,008.28. The excess of admissions and constant sickness at Fort Yates was due to vaccinia, tonsillitis, and injuries, the excess of constant sickness at Fort Snelling to injuries and diseases of the organs of the special senses, for which four discharges on certificates of disability were effected during the year. Forts Custer and Keogh, Mont., had their rates of noneficiency nearly as high as the army average, but their admission rates were low, 818.71 and 982.52, respectively, notwithstanding that at Fort Custer the venereal rate was above the average. Forts Missoula and Harrison, Mont., had particularly low admission rates, 628.68 and 653.22, respectively, while their constant sickness was much below the average. Fort Assinniboine, Mont., had both rates low, admission 540.60 and noneffective 18.12, while the small post, Fort Yellowstone, Wyo., had the unusual rates of 398.15 for admissions and 9.59 for noneficiency.

DEPARTMENT OF THE PLATTE.

Reported strength, 2,529. Admission rate, 1,202.85; rate of noneficiency, 34.11; discharge rate, 9.09; death rate, 5.93. In this department the only variation from the army average consisted of a slight excess of admissions. Fort D. A. Russell, Wyo., had a large admission rate, 1,663.07, but its constant sickness was not correspondingly large—37.89. The excess of admissions was due to tonsillitis, bronchitis, rheumatism and myalgia, alcoholism, diarrhea, and injuries. The slight excess of noneficiency was attributable chiefly to the three first-mentioned causes. Fort Crook, Nebr., had a large rate of constant sickness, 46.41 per thousand of strength, although its admissions did not greatly exceed the average. The increased rate was the result of venereal affections, diseases of the eye, injuries, and heart disease, two cases of which were discharged on certificates of disability. At Fort Washakie, Wyo., the admission rate was considerably larger than the average; at Fort Niobrara, Nebr., it exceeded the average but slightly, while at both posts the noneffective rate was the same as that of the Army as a whole. Fort Meade, S. Dak., and Fort Robinson, Nebr., had rates well below the army standard for the year—admission, respectively, 1,000 and 1,002.64; noneffective, 28.40 and 27.82.

DEPARTMENT OF TEXAS.

Reported strength, 1,725. Admission rate, 1,203.48; rate of noneficiency, 36.41; discharge rate, 11.01; death rate, 9.28. All these rates are somewhat higher than the average rates of the Army, the death rate being specially high. The slight excess of admissions was chiefly due to diarrheal cases; the slight excess of noneficiency to venereal cases, boils and abscesses, and typhoid fever; the excess of discharges to tuberculosis of the lungs and rheumatism; the excess of deaths to alcoholism, diseases of the digestive system, and injuries. Fort Clark had the highest admission rate, 1,970.35, but its constant sickness, 48.70, was exceeded by several of the other posts. The small camp at Eagle Pass had nearly as high an admission rate, 1,926.47, with a noneficiency of 65.74. Fort McIntosh also had a large constant sickness, 63.67, although its admission rate was relatively low, 1,436.97. The noneficiency at Fort Brown was high, 47.23, although its admissions were but slightly in excess of those of the Army. Fort Ringgold had

both rates a little higher than the average. The high rate of admission at Fort Clark was occasioned by diarrhea, boils and abscesses, injuries, and venereal diseases. Diarrheal cases equaled 301.89 per thousand of strength, as compared with the army rate of 80.02; boils and abscesses, 218.33, as compared with 42; injuries, 471.70, as compared with 279.75; and venereal cases, 121.30, as compared with 78.08. The nonefficiency at Camp Eagle Pass was caused by injuries, boils and abscesses, vaccinia and typhoid fever, and particularly by venereal cases, which added 19.37 to the rate, instead of the army average of 5.26. At Fort McIntosh, also, the large nonefficiency was mainly the result of venereal infection, the rate for which alone amounted to 22.36, equivalent to more constant sickness than was occasioned at Fort Bliss by all diseases and injuries. At Fort Brown a marked increase in the rates for venereal diseases, alcoholism, neuralgia, rheumatism and myalgia, diarrhea, typhoid fever, and injuries made up the sum of the excess of the constant sickness over that of the Army as a whole.

But for the two posts, Fort Sam Houston and Fort Bliss, the rates of this department would have been much higher than they are. The excellent medical records of these posts offset the bad records of the others. The admission rate at Fort Sam Houston was 800.31, the constant sickness, 27.70, while the corresponding rates at Fort Bliss were 945 and 21.31.

DEPARTMENT OF THE COLORADO.

Reported strength, 3,072. Admission rate, 1,117.51; rate of nonefficiency, 32.11; discharge rate, 11.72; death rate, 6.18. These rates differ but little from the average of the Army. Fort Wingate, N. Mex., is the only post in this department with a decidedly bad medical record for the year, as compared with the general army record, its admission rate being 1,570.75 and its noneffective rate 46.44. The excess of admissions was due to an increased prevalence of tonsillitis, diarrhea, bronchitis, rheumatism and myalgia, and injuries, while the excess of noneffectiveness was attributable to the same causes with, in addition, a high rate for typhoid fever and for heart disease, of which last there were four cases, with one discharge for disability and one death. Fort Logan, Colo., and Fort Huachuca, Ariz., had both rates higher than the standard of the Army for the year. There was an excess of diarrheal and venereal cases at both posts, with, in addition, at Fort Huachuca, an excess of injuries and rheumatism and myalgia. The frequency of injuries at Fort Grant raised the rates of this post somewhat above the average.

The other posts in this department had excellent rates, the best admission rate being that recorded at Fort Apache, Ariz., 784.62, nearly one-half of which was caused by injury, and the best rate of constant sickness, 21.25, at Fort Bayard, N. Mex.

DEPARTMENT OF CALIFORNIA.

Reported strength, 1,539. Admission rate, 762.18; rate of nonefficiency, 24.02; discharge rate, 7.15; death rate, 3.90; all of which are far below the average of the Army for the year. These low rates resulted from a generally lessened prevalence of all diseases and injuries, except venereal diseases, for which the admission rate was 77.32, and the constantly noneffective, 5.25, as compared with the corresponding army rates, 78.08 and 5.26. The small post, San Diego Barracks, had a large nonefficient rate owing to the prevalence of venereal diseases

and rheumatism and the occurrence of a prolonged case of tuberculosis of the lung. The Presidio of San Francisco had an admission rate of 994.63 and a nonefficient rate of 30.15. All the other posts had smaller rates, the lowest admission rate, 523.44, having been recorded by Angel Island, with a nonefficient rate of 21.56, and the lowest nonefficient rate, 13.96, by Benicia Barracks, with an admission rate of 540.67.

DEPARTMENT OF THE COLUMBIA.

Reported strength, 1,491. Admission rate, 880.62; nonefficient rate, 28.78; discharge rate, 7.38; death rate, 2.01. Venereal diseases were less frequent in this department than in California, but a slight excess of injuries and such diseases as tonsillitis, alcoholism, colic and constipation, boils and abscesses, rheumatism and myalgia raised the admission and nonefficient rates above those of the latter department. No post in the Department of the Columbia had an admission rate higher than that of the Army, and Fort Walla Walla was the only one which had a nonefficient rate above the army average. The admission rates varied from a maximum of 1,039.37 at the post just mentioned to a minimum of 734.04 at Fort Canby, and the nonefficient rates from 41.42 at Fort Walla Walla to 22.52 at Vancouver Barracks. Venereal affections and injuries occasioned the relatively high rates at Fort Walla Walla.

THE HIGHEST AND LOWEST RATES AT INDIVIDUAL POSTS.

The largest admission rates for the year were reported from Washington Barracks, D. C., and Fort Myer, Va., 2,250.71 and 2,250, respectively, per thousand of strength. These two posts have had high rates for a number of years; malarial infection was the principal cause of these high rates. An investigation was made during the past year by Surg. W. Reed, who concluded that the fevers at both posts were to be attributed to the marsh lands of the Potomac valley. His report was published in my last annual report, page 66. The malarial rate continued high at Washington Barracks during the past year, but the cases at Fort Myer were relatively not so numerous. These two posts, although heading the list of sickness as represented by frequency of admissions, take only the twelfth and the fifteenth place, respectively, when the posts are arranged in order of nonefficiency from sickness. Following Fort Myer in frequency of entries on the sick report are Fort Clark, and Camp Eagle Pass, Tex., each with over 1,900 entries per thousand of strength; Fort Slocum, N. Y., and Fort D. A. Russell, Wyo., with over 1,600, and Fort Riley, Kans., Fort Monroe, Va., Jefferson Barracks, Mo., Fort Wingate, N. Mex., and Fort Barrancas, Fla., with over 1,500. The causation of these rates has already been stated in discussing the health of the departments. Jefferson Barracks, Mo., had the highest rate, 67.23, of constant sickness, although only ninth in order of frequency of admissions. This was owing to the prolonged duration of its fever cases, malarial and typhoid. Two other posts, Camp Eagle Pass and Fort McIntosh, Tex., had a constant sickness of over 60 per thousand of strength. Three posts, Fort Barrancas, Fla., Fort Thomas, Ky., and San Diego Barracks, Cal., had each over 5 per cent of constant nonefficiency. Following these in the order of diminishing rates are Forts Clark and Brown, Tex., Fort Wingate, N. Mex., Fort Crook, Nebr., Fort Monroe, Va., and Washington Barracks, D. C., the last with a rate of 44.51 for the year. Fort Yellowstone, Wyo., had the best medical record during the year, it having had the lowest admission and nonefficient rates, with no death and no discharge. Its

admission rate was 398.15, with less than 1 per cent of constant sickness, 9.59 per thousand. Including this garrison there were eight posts which had an admission rate of less than 600. Alcatraz Island, Cal., 477.61; Fort Porter, N. Y., 486.96; Angel Island, Cal., 523.44; Fort Assinniboine, Mont., 540.60; Benicia Barracks, Cal., 540.67; Fort Trumbull, Conn., 558.82, and Fort Wayne, Mich., 568. Sandy Hook Proving Ground, N. J., had less than 1 per cent of constant sickness, 9.71 per thousand; Benicia Barracks, Cal., had 13.96, and the large post, Fort Assinniboine, Mont., 18.12.

PREVALENCE OF SPECIAL DISEASES.

SCARLET FEVER.

Only 2 cases of this fever occurred among the troops during the calendar year, both cases at Angel Island, Cal. Since the close of the year several cases have been reported from military posts. On December 31, 1896, the surgeon of Fort Apache, Ariz., reported 1 case in each of two families; quarantine was raised February 2, and no fresh case was developed. At Plattsburg Barracks, N. Y., 3 cases occurred among children attending school in the town; isolation and disinfection prevented further spread of the disease. In March, 1897, a case was reported as present in the family of an officer at Columbus Barracks, Ohio; the infection was suppressed in this instance also. About the same time the disease made its appearance at West Point, N. Y., in the family of an enlisted man, attacking four children and resulting in the death of one girl 6 years of age. In May 2 cases were discovered in another family at this post, but no connection could be traced between these cases and those which had appeared earlier in the season. In April the son of the hospital steward at Fort Schuyler, N. Y., became infected by attending school in the city. In May 2 cases were reported in families at Fort Missoula, Mont., but no spread of the disease took place. Twelve cases in four families occurred at Fort Adams, R. I., between February and May. The families lived next to each other and had daily contact. Three enlisted men are included in these 12 cases; the original infection in this instance came from Newport, R. I.

The importance of inquiry into the source of the milk supply of a military post is demonstrated by an outbreak of scarlet fever at Fort Niobrara, Nebr., in January last. An officer was taken into the isolation ward of the hospital on account of a suspicion of this fever. It was discovered that he had been exposed to the infection in the town of Valentine. This led to an investigation, during which it was found that 3 cases had occurred in the family of a ranchman who sold milk in the garrison. Milk from this source was, of course, immediately interdicted. The importance of a supervision of the milk supply by the medical officer is suggested as well by this incident at Fort Niobrara as by the careful inspection of the sources of milk supply at Fort Sheridan, Ill., made by Capt. Charles E. Woodruff, assistant surgeon. (See p. 162.)

MEASLES.

During the calendar year 244 cases of this disease were reported. They were distributed at 33 posts, nine of which had 1 case each, and nine 2 cases each; four posts had 4 cases each, one 5, one 6, one 7, and two 10 cases. Columbus Barracks, Ohio, reported 20 cases; Washington Barracks, D. C., 21; Fort Leavenworth, Kans., 25; Fort Thomas, Ky., 26; Fort McPherson, Ga., 31, and Fort Riley, Kans., 40 cases.

Since the close of the year the disease has shown itself at a number of posts: In January, 1 case among the enlisted men at Fort Crook, Nebr.; in February, 1 among civilian employees at Fort Apache, Ariz., where the disease was prevailing extensively among the Indians; in March, 1 at Angel Island, Cal., and 9 at Fort Walla Walla, Wash., the disease being epidemic in the town adjoining the latter post; in April, 1 among children at Vancouver Barracks, Wash., and 1 among enlisted men at Fort Custer, Mont.; at Madison Barracks, N. Y., 1 in April, 2 in May, and 2 in June, and at Boise Barracks, Idaho, 9 in May. Isolation and disinfection appear to have controlled these outbreaks. At Fort Monroe, Va., however, a large number of cases occurrred, 52 among enlisted men in March and April, and 4 among civilians in May.

Recurrences of the disease were reported by two medical officers. At Fort Warren, Mass., 2 children, 4 and 6 years of age, of the same family had a mild attack in April, both having already had a severe attack in January. The other instance of recurrence was reported by Surg. George W. Adair, from Washington Barracks, D. C. Cases 6166 and 6167 of the hospital register of that post were admitted together February 20, 1896, from the same battery. Both were affected with fever, bronchitis, sore throat, and eruption. The cases were apparently identical, and no doubt were cases of measles. They were isolated in a spare room in adjacent beds and their eruptions admitted of ready comparison. One was returned to duty March 4, the other on March 5. Ten days later the man who had been reported as 6167 was readmitted with the same symptoms. The eruption was closely scrutinized by the surgeon and his two assistants, and no difference between it and that of other cases of measles could be discovered.

SMALLPOX.

No case of smallpox occurred during the year 1896. One case of varioloid was reported from Madison Barracks, N. Y., January 25, 1897; no spread of the infection from this case was permitted.

INFLUENZA.

The number of cases of influenza reported during the calendar year was 942, two of which ended fatally. The largest number at any one post was 117, at Fort Logan, Colo; 74 cases were reported from the Presidio of San Francisco, Cal. Little is said in the reports concerning this disease. At Fort Reno, where a number of cases occurred in January, 1897, it is said to have been of a mild type. In the same month 112 cases were recorded at Fort Robinson, Nebr. The surgeon at this post considered the spread of the disease to have been favored by defective ventilation of barracks. At Fort McHenry, Md., the cases under observation complained of headache and acute pains in the limbs, accompanied by either slight sore throat or bronchial symptoms, but with an elevation of temperature out of all proportion with their other symptoms. After the subsidence of the abnormal temperature by lysis there remained for a few days lassitude and weakness, not observed in ordinary colds or sore throats.

TONSILLITIS.

There were reported during the year 1,023 cases of tonsillitis, equal to a rate of 40.73 per thousand of strength. This prevalence differs but little from that of 1895 or from the annual mean of the Army for the preceding decade, 41.74 and 42.73, respectively. The rate was

higher for the colored troops than for the white troops, 55.58 and 39.37. The rates for this disease were lowest in the Department of California, 11.05; Texas also had the rate low, 15.07. In fact, the rates were lower than the Army average in all the departments, except the Department of the Platte, which had 94.50, and the Department of the Colorado, which had 60.88. Colored troops were stationed in both of these departments, but the large rates are not due to their presence, for the proportion of colored troops in the Department of Dakota was much greater than in either of these commands, and its rate was only 34.40 per thousand of strength.

The posts from which the largest absolute number of cases were reported were also those which had the highest rates. The rate of Fort Bayard, N. Mex., was 192.09 per thousand, caused by the occurrence of 62 cases. At Fort D. A. Russell, Wyo., 71 cases gave a rate of 153.35, while the 73 cases at Fort Niobrara were equivalent to a rate of 145.42. The surgeon at the first-named post called attention to deficient air space and ventilation in the barracks, to which he attributed the cases of tonsillitis and febricula, which constituted 25 per cent of all his admissions to sick report during the month of November. (See infra, p. 140.) The surgeon at Fort D. A. Russell reported the occurrence of tonsillitis of a severe type during the month of February, but was unable to determine the insanitary conditions in which the cases originated. Defective drainage was the notable fault in the sanitary system at Fort Niobrara.

MUMPS.

Mumps occasioned 71 admissions to sick report among the enlisted men of the Army during the calendar year. Fort McPherson, Ga., had 32 cases and Fort Barrancas, Fla., 17, while the remaining cases were scattered, 1, 2, or 3 at each of 14 posts.

DIPHTHERIA.

Forty-seven cases of diphtheria were reported from six military stations during 1896. Fort Crook, Nebr., furnished 29 of these, but there was some doubt as to the accuracy of the diagnosis of many of them, as the bacillus of diphtheria was not found in any one of four tubes sent to the Army Medical Museum for verification, although it was present in two out of three slides that were submitted. An abstract of Dr. Kieffer's description of these cases was published in my last annual report, page 38. Fort Custer, Mont., had 13 cases, resulting from an outbreak which took place in 1895 and extended into 1896. Other than these the only cases reported during the year were 1 each at Fort Columbus, N. Y., Fort Leavenworth, Kans., and Fort Niobrara, Nebr., and 2 at Fort Yates, N. Dak. The infrequency of the cases thus reported was no doubt due in part to the care taken in verifying them by bacteriological methods. During the continuance of the disease at Fort Yates pharyngitis and tonsillitis—particularly the follicular form of the latter—were unusually prevalent, but in none of them did cover-slip examinations reveal diphtheria bacilli, nor did the subsequent clinical course of the ailment resemble diphtheria; but nevertheless all necessary precautions were taken to prevent the spread of diphtherial infection.

Since the close of the calendar year the disease has been almost absent from our military garrisons. In May, 1897, a case occurred in the family of an enlisted man at the Presidio of San Francisco, Cal. About the same time the disease was prevailing in the town of Vancouver, Wash., where, of 6 cases, 3 died; but no case appeared among

the residents of the military reservation. In June a case was reported as isolated and under treatment at Fort Custer, Mont.

Favorable results continue to be obtained by the use of antitoxin, as illustrated by a report furnished by Maj. James P. Kimball, surgeon, Fort Columbus, N. Y. A case of diphtheria of moderate severity occurred in the family of a private soldier, the patient being a boy aged 9 years. The diagnosis was verified by bacteriological examination. Diphtheria antitoxin (750 units) obtained from the New York health department was administered. This was followed by the disappearance of the membrane and marked improvement at the expiration of thirty-six hours, with speedy convalescence. In the family were four other children, the youngest 2 months of age and the oldest 10 years. To these immunizing injections of 100 to 250 units were given, and they escaped attack, although living in the same room with the affected child. A culture from the throat of the patient, June 24, showed none of the Klebs-Loeffler bacilli, and on June 25 the quarters were disinfected and the quarantine raised. The disease was probably contracted in New York City, where the patient had been attending a public school. On June 23 another case of diphtheria appeared in the family of a civilian employed at headquarters Department of the East, the patient a boy aged 5 years. In this case the exudation extended from the pharynx into the posterior nares. Antitoxin (900 units) was injected on the second day, and at the end of twenty-four hours the false membrane had begun to melt away, and at the expiration of thirty-six hours had disappeared. In this family were two other children aged respectively 2 years and 6 years, to whom immunizing injections were given of 175 and 225 units.

Similar favorable results are recorded by Lieut. J. H. Stone, assistant surgeon, Fort Leavenworth, Kans., in two cases that occurred during the calendar year.

CASE NO. 1.—Private R., band, Twentieth Infantry, consulted me October 24, complaining of headache and sore throat. A diphtheritic membrane covered the greater portion of both tonsils and extended upon the pharynx and posterior surface of the uvula. The fauces were much inflamed, tongue coated, and submaxillary lymphatic glands enlarged; temperature, 101.4°. An agar tube was inoculated with some of the exudate, which was also examined microscopically. This latter showed the presence of Klebs-Loeffler bacilli in considerable number. It is of interest to note that the pus organisms were almost entirely absent. The patient was isolated at the hospital and the following treatment instituted: A saline purge was given and light diet ordered. He was instructed to gargle his throat every hour with a 1-per cent carbolic acid solution; tincture of the chloride of iron and glycerine were given internally at short intervals. Antitoxin was sent for and administered at 8 p. m. of the same day, the patient receiving 10 c. c. of a serum of 1,000 immunizing units. Rapid recovery ensued, and on October 28 the membrane had completely disappeared, leaving a raw and bleeding surface. His temperature remained subnormal for two days after the use of the antitoxin. Microscopical examination of mucus from the throat showed the presence of specific organisms, but a similar examination on November 2 proved negative. After the room and the patient's clothing had been disinfected he was sent to duty November 5. No after effects resulted.

CASE NO. 2.—An officer of the Second Infantry called me in to see his son, who had a sore throat. On examination, a small patch, which the microscope showed to be diphtheritic in character, partly covered the right tonsil. The throat and fauces were much inflamed, and he suffered from dysphagia, headache, and fever; temperature, 102.4° F. Quarantine was ordered, the patient isolated, and local treatment (carbolic-acid gargle, 1 per cent) instituted. Antitoxin was sent for and administered on the evening of the same day. By morning the temperature had dropped to 97.8° F. Patient went on to rapid recovery. Microscopical examination of mucus from the throat proved the absence of the organisms of diphtheria on November 5, and quarantine was raised November 8. No after effects.

Both of these cases were undoubtedly contracted in the city of Leavenworth, where diphtheria is prevalent. No connection with any previous case at this post could be traced.

CEREBROSPINAL MENINGITIS.

No case of this disease was reported during the calendar year, but on the monthly report of sick and wounded, April, 1897, from Fort Assiniboine, Mont., the diagnosis of cerebral meningitis was made in the case of an officer of the Tenth Cavalry. Lieut. E. L. Munson, assistant surgeon, in a special report on this case, gives the history of several other cases seen by him about the same time. These cases are suggestive of the spotted fever reported from Idaho in my last annual report, page 60. In the spring months a fever with marked clinical characters prevails in the mountains and valleys in the neighborhood of Boise Barracks, Idaho. The course of the febrile movement is somewhat similar to that of typhoid fever, but there is no indication of any local intestinal lesion. There is intense headache with afterwards dullness of mind and grievous pains in the muscles, bones, and joints, and an eruption of circular red spots one-eighth of an inch in diameter, but which subsequently become larger, purplish in color, and desquamate as convalescence is established. The disease is seldom fatal. Dr. Munson's report from Fort Assiniboine is as follows:

An infection similar in its essential symptoms to those with which this officer has been affected has occurred at this post ten times during the year, eight appearing during the latter half of April, and one in May, 1896. Besides these I have had the opportunity of treating another such case, in September, 1896, in a ranchman resident in this vicinity. This disease presents all the prodromic and early characteristics of cerebral or cerebrospinal meningitis, according to the extent of the meningeal involvement, and is typical of the usual course of the disease during the early stage. The later symptoms are absent, coma does not develop, the affection manifests no tendency toward a fatal termination, and complete recovery follows a lengthy convalescence. I have been able to find no reference to any such affection, with a mortality of zero, in any of the authorities accessible. In Ziemssen alone is described a "cerebrospinal meningitis abortiva," but this is said to be a mild form, only seen in a few individuals toward the end of an epidemic accompanied by high mortality. The symptoms, as observed here, are indicative rather of meningeal irritation than actual inflammation, and there has been no reason to believe that there has been purulent exudation in any of these cases, the majority of which have been of only a few days' duration. The disease appears to be much more prevalent in the spring, 10 of the 11 cases occurring at that time, but does not seem to be dependent upon any constant meteorological conditions. Nearly all the cases having occurred in negroes, it was impossible to determine the presence of any characteristic eruption. In the two more severe cases occurring in whites one showed a few irregular, purplish red maculæ over the chest and abdomen, the other nothing more than a herpes labialis. The disease first appeared in Company C, Twenty-fifth Infantry, and this organization subsequently furnished half the cases. There was undoubted crowding in the quarters occupied by this company, but not to a greater degree than in those used by other organizations in which the disease at no time appeared, and furthermore it was not limited to the occupants of any one squad room. As far as could be seen, the surroundings and conditions governing this organization differed in no way from those obtaining throughout the post. In its clinical course the disease begins suddenly, always with severe headache, associated with fullness and tension, and usually with muscular pains in the back, loins and lower extremities. In some instances this pain is limited to the back of the neck, which may feel stiff and more or less tender to the touch. There is often a prodromic stage of chilliness and shivering. The headache is constant, confined to no part of the head, and is increased by light, sound, or motion. Nausea and vomiting occur in about half the cases. The conjunctivæ are injected, and there is anorexia and constipation. In the majority of instances the symptoms advance no further. With rest, quiet, bromides, and possibly the ice cap, recovery is only a matter of a few days.

Eight such cases appear on the reports of sick and wounded for this post for April and May, 1896, as being "remittent fever" because it was thought impossible that an affection described by the text-books as having an average mortality of about 60 per cent could present as uniformly mild a type as was seen in these cases. Some of these patients received quinine and some did not, but all made rapid recoveries. Blood examinations were made in several instances, but the presence of the plasmodium malariæ could not be determined. Inasmuch as malarial infection has been

otherwise unknown in this post and vicinity, it would seem as if this diagnosis was hardly tenable, especially in the light of later cases. Several cases have also appeared which approach a more severe type. In these instances there has been more or less rachialgia, the spinal ice bag being indicated in two instances. One case presented mild nocturnal delirium, two had hallucinations on shutting the eyes, one double vision with "muscæ volitantes" and unequally dilated pupils. There was one case of stupor or semicoma. The inception of one case was marked by sudden unconsciousness with no premonitory symptom, in another the disease began with obstinate vomiting, induced by light or motion of the head, while in a third the attack was ushered in by severe chills. Intense headache was an invariable concomitant. Marked rigidity of the muscles of the back of the neck, with retraction of the head was seen in several instances. Involuntary twitching of the muscles of the lower extremities has been noted. The tongue is heavily furred, the teeth coated with tenacious sordes, the breath extremely fetid, and the bowels constipated. The temperature is never greatly elevated, a slight rise of a degree or so being the usual condition. When the cerebral symptoms are most marked fever may be entirely absent. Treatment, consisting of salines, bromides, and the ice cap, renders the patient much more comfortable, but has no apparent influence on the affection itself. Convalescence is tedious, and for some weeks the patient is indifferent, easily exhausted, and subject to headache and vertigo. During convalescence, exposure to a hot sun invariably produces severe headache. The history of the following case, which was the first noted in this vicinity, was kindly furnished by Capt. P. R. Egan, assistant surgeon:

CASE 1.—Private J. R., Company C, Twenty-fifth Infantry. No premonitory symptoms except a slight headache, suddenly fainted while at morning drill, with vomiting on recovery. Remained in a dazed or semicomatose condition for three days, only rousing on interrogation, to complain of intense headache. On the third day there was marked retraction of the head, with tenderness of the muscles of the back and neck, and along the spinal vertebræ. This condition lasted four days. The symptoms gradually abated and the patient was discharged from hospital on the fourteenth day. The pulse was slow, ranging about 50, and the temperature, at first subnormal, never rose as high as 100°.

CASE 2.—A. C., white, sheep raiser. Early in September, 1896, wolves killed a sheep and were set upon by the shepherd dogs. In order to save his dogs Mr. C. joined in the fight and became greatly overheated, excited, and exhausted. A few hours later he had severe chills and headache, shortly followed by nausea, vomiting, and boneaches. I saw the case on the second day. Temperature was slightly subnormal, pulse 42, full and strong. There was intense headache, greatly aggravated by light, motion, or sound. Nausea was present, though vomiting had shortly before ceased. There were nocturnal delirium, spots before the eyes when open, and hallucinations when shut. The pupils were unequally dilated and the conjunctivæ injected. The patient was very restless, and there was involuntary twitching of the lower extremities. The head was not retracted, although the muscles of the back of the neck were sensitive to touch, and percussion along the upper half of the spine was painful. A few atypical, purplish spots were scattered over the chest and abdomen. Constipation was marked, the breath extremely foul, and the teeth covered with sordes. I saw the patient a week later and noted marked general improvement. A week after this second visit, the patient being still very weak, he attempted to walk some distance in the hot sun. This imprudence was promptly followed to some extent by a return of the original symptoms, lasting nearly ten days. Convalescence was long and tedious, the patient being weak, easily exhausted, and prone to headaches for several months afterwards.

CASE 3.—Lieutenant, Tenth Cavalry. Patient had returned within the week from a three months' leave, spent chiefly in Alabama. Applied for "something for headache" about 10 o'clock in the morning, and feeling much better shortly afterwards went out with the hounds. After having gone about 5 miles, headache returned, with vertigo and nausea. He could scarcely sit his horse, and having dismounted was almost unable to remount and get home. At 2 o'clock the headache was intense and vomiting set in, occurring every few minutes, being induced by light or motion of the head. Firm pressure on the temples and forehead enabled patient to turn in bed, with less nausea. Later symptoms were marked photophobia with pain in loins and legs. There was irritability to sound, difficulty in remembering words, and double vision, the latter persisting for several weeks. Sleep was obtained only by the use of hypnotics and was disturbed by dreams. There was fever at no time. The pulse, 62 at the outset of the disease, was only 40 on the third day, after which it gradually returned to normal. There was a herpes labialis and the usual disordered condition of the intestinal tract. Convalescence was tedious, and recovery not complete for over six weeks.

TYPHOID FEVER.

The admission rate for typhoid fever, 5.89 per thousand of strength with a nonefficiency of 0.85, is an increase over the rates of the previous year, which were 4.32 and 0.67. The absolute number of cases was 148, of which 17 were fatal. The largest number of cases occurred at Fort Brady, Mich., 15, with 1 sent in from the field; 12 were reported from Fort Logan, Colo., 11 from Fort Sam Houston, Tex., 10 from Jefferson Barracks, Mo., 8 from Fort Sill, Okla., and 7 from Fort Custer, Mont. The remaining cases were scattered, 1, 2, or more at each of forty-two different posts.

Recently a local outbreak was reported from Fort Barrancas, Fla. In May a large number of malarial cases occurred in Battery H, First Artillery. The surgeon saw no obvious cause for this, as the sanitary condition of the post was good, and Battery L, which lived in the same building, drank the same water supply, and had the same fatigue duty and exposures, was not affected by the malarial influence. Battery H had suffered severely from the disease at Davids Island, N. Y., during the previous summer. The unusual prevalence was therefore referred to an infection brought from New York Harbor, and developed into activity by favorable conditions independent of local sources of malaria. Meanwhile, in May and June, 7 cases of typhoid fever occurred, but these were confined to the men of Battery L. This battery came to Fort Barrancas from Fort Wadsworth, N. Y., where typhoid fever was present at the time of its departure. Two cases were taken into hospital within a short time after its arrival at Fort Barrancas. It is supposed, therefore, that the typhoid bacillus was brought from the North with this command, as the plasmodium was brought by the other battery.

The frequent association of malarial and typhoid cases is seen in the history of the febrile outbreak among the troops at Jefferson Barracks, Mo., after their return from the target range at Arcadia, submitted below (p. 77).

In August, 1896, an epidemic of typhoid occurred at Fort Brady, Mich., among the men of Companies C and F, Nineteenth Infantry. These commands had been in camp near Rexford at target practice from July 22 to August 6. Companies B and D of the same regiment and from the same post had preceded them at the range, but these companies did not become affected with the fever. Capt. Charles Richard, assistant surgeon, made a special report on the outbreak, which he attributed to foul surface water drank on the return march from the target camp to the post. It appears that later in the season Companies C and F were ordered to Fort Wayne. While en route to this post, and near Lansing, September 4, two men belonging to Company F became sick with fever and were immediately forwarded to hospital at Fort Wayne. After the arrival of the companies at this post, September 10, two men belonging to Company C became sick and were taken into hospital with typhoid fever. Deputy Surg. Gen. J. M. Brown referred the causation of these cases to the target camp. Following this is the report of Captain Richard, with the remarks of Deputy Surgeon-General Brown, on the origin of the cases:

[Report of Captain Richard.]

I have the honor to submit the following report of the outbreak of typhoid fever which recently occurred at this post, with histories of cases and thermographs. With one exception, the disease affected only the enlisted men of Companies C and F, Nineteenth Infantry. The exception will be subsequently referred to. The

affected companies had been encamped at the target range from July 22 to August 6, and on the latter date began the march back to the post, which was reached on August 7. They had been preceded at the rifle camp by the other two companies of the garrison (B and D, Nineteenth Infantry) from June 29 to July 17. At the camp both battalions were subject to the same conditions as regards water and place of encampment, yet no case of the disease appeared among the men of the first battalion. This fact would apparently exclude the conditions existing in the camp as causative factors in the outbreak of the disease.

At the post all the companies are quartered in the same barrack building; each affected company occupying with a nonaffected company half of the barrack building; they all use the same water, supplied by a common main, and all mess together at the consolidated mess; the water-closets, plumbing, and sewers of all the company quarters are practically identical. There are no conditions at the post which could in any way affect one company differently from another.

Investigation showed that on the return march from camp Companies C and F (the affected companies) marched over a somewhat different route from that taken by the first battalion, and that they made a halt at a crossing of a stream at a point where two railroads run over it. This stream is here narrow and sluggish, and at a considerable depth below the railroad trestle which crosses it. At the time of my inspection of this place, fecal deposits were abundant on the banks of the ravine made by the railroad grade through which the stream passes, and its pollution is unavoidable. The men drank freely of this water, and all of those stricken with disease acknowledge to have partaken of it. None of the men of the affected companies who were with the wagons, which did not come over this route, were taken sick with the disease. No case of typhoid fever has heretofore occurred at this post following encampment of the troops at the rifle range. From these facts it is but fair to presume that the water of this stream was the source of the infection of the command.

The other case referred to above, which appeared at the post, was in the son of one of the officers. This boy had also been at the rifle camp from July 26 to July 31, but went there and returned from there by rail, so he could not have been infected by this water. He was taken sick almost immediately after his return, two weeks before any of the enlisted men were affected, so that a different origin in this case must be sought for. While at the post this boy drank only sterilized water, but on several occasions previous to his visit to the camp he drank water from wells in different parts of the surrounding country, of the quality of which I am unable to express an opinion, but from the fact that typhoid fever is quite prevalent throughout the country surrounding this post such waters may be considered to be suspicious.

The number of cases among the enlisted men was 16, equally divided between the two companies. The first case reported sick on August 15, on the eighth day after partaking of the suspected water; the last case was admitted on September 2. The latter patient admits having been sick for at least six days prior to admission. If the assumption that the water from the stream was the source of infection is correct, the period of incubation in this instance would range from eight to twenty days, which is consistent with the experiences of others.

Following are the histories in brief of some of the cases, with the results of autopsies in the two fatal cases. These histories are in part made up from notes taken by Asst. Surg. Henry A. Shaw, who was in charge from the beginning of the outbreak to September 1.

CASE 1.—Private B. F. B., Company C, Nineteenth Infantry, aged 29 years, was admitted to the hospital on August 14, 1896. He stated that he had been suffering for two days with headache and muscular pains, and that on the previous evening he had had a chill, which was not followed by a sweat. On admission he complained only of headache and pains in back; bowels are constipated; tongue slightly coated. On the day after admission morning temperature was 100°; evening temperature 102.4°. Abdomen was now tympanitic; there was some tenderness in the right iliac fossa, and the spleen was distinctly enlarged. Slept poorly during the night. Patient presented no other symptoms except occasional diarrhea for a few days, temperature ranging about the same until the 21st, when it began to go down, and he expressed himself as feeling better, though he still slept poorly and complained of some headache. On the tenth day after admission he still had a slight diarrhea, but on the eleventh day the temperature was normal in the morning and 99° in the evening, and he was apparently convalescing. Two days after, however, the temperature began to ascend in the evening, with marked remissions in the morning; headache and anorexia now returned; diarrhea continued, the evacuations being of a pea-soup character; abdomen became more tympanitic and tender, splenic enlargement more marked, and on September 1 rose spots over abdomen were first noted. The tongue was now brown, dry, and fissured; teeth were covered with sordes, and the pulse soon became more rapid, feeble, and dicrotic; delirium appeared, and patient was very restless at night and dull and stupid during the day, picking at the bedclothes;

subsultus tendinum present; bowels moderately loose. Temperature continued to ascend in spite of the baths, which were administered whenever the thermometer showed a temperature of 102.4°, until September 6, the twenty-fourth day after admission, when it began to decline, and fell steadily until the evening of September 10, when it rose again to 104° without any discoverable cause. After this it continued to fall, reaching the normal on September 12, the twenty-ninth day after admission. From this date patient made a slow but steady recovery, and was returned to duty on October 27, 1896.

CASE 2.—Private C. W. L., Company F, Nineteenth Infantry, aged 22 years, was admitted to the hospital August 15, 1896, complaining of severe headache and pain in bones. He stated that he had been suffering from headache and pain in bones and back, and with cough, for two or three days prior to admission, which he ascribed to "catching cold." The chest symptoms in this case were so prominent from the start as to mask the diagnosis for several days. His cough was severe, paroxysmal in character, with profuse muco-purulent expectoration, which two days after admission contained streaks of blood. Examination of chest showed a few fine, moist râles over base of right lung posteriorly. Pulse was of good volume and force—about 100. Spleen was somewhat enlarged; abdomen slightly tympanitic, tender on pressure over right iliac fossa; no rose spots were observed; bowels constipated; urine negative; temperature on evening of day of admission, 102.2°. During the ten days following admission patient complained mostly of his cough. Bowels alternately loose and constipated; stools light yellow in color; abdomen continued to be tympanitic, and he slept very poorly and looked badly. Tongue was comparatively clean and moist. About the end of this time there was evidence of a small patch of consolidation over the base of the right lung posteriorly. By the end of the second week the consolidated portion of the lung appeared to clear up, though the cough still continued, and the patient appeared brighter than for some time, the temperature having been falling for several days, morning remissions being well marked. On the sixteenth day after admission the temperature began to rise again, cough increased in severity and frequency, and patient became very restless and sleepless. The lungs showed the presence of hypostatic congestion, but his tongue remained moist and comparatively clean; no rose spots were observed. He had a characteristic diarrhea, though slight; he was at no time delirious; his pulse was of good volume and force, and he was apparently doing well, when on the twenty-fifth day after admission he had a profuse bloody stool, containing both clots and fluid blood. Two more large, bloody stools followed within six hours, in spite of astringents and opium. Pulse now became rapid (140) and feeble, and, though he had no further discharges from the bowels, it was evident that the bleeding was still going on, and he rapidly sank into a state of collapse and died in about twenty hours after the first hemorrhage.

Autopsy (three hours after death).—Rigor mortis present. Body emaciated. Head not examined. The lungs were the seat of hypostatic congestion, with splenization of both bases. Heart apparently normal. Liver perhaps slightly enlarged, pale and firm; otherwise appeared to be normal. Spleen enlarged to about twice the normal size, almost black in color, and greatly softened. Pure cultures of the typhoid bacillus were obtained from the spleen. Kidneys were apparently normal. The peritoneal surface of the intestines was reddened and markedly injected. The small intestine, for about its lower 3 feet, was distended with dark, coagulated blood. The mucous membrane showed the presence of numerous thickened and infiltrated Peyer's patches and solitary glands, and numerous ulcerations, varying in size from 3 to 1 cm., with overhanging edges and sloughing bases. The large intestine contained about a liter of coagulated blood, and presented the same anatomical changes as the small intestine. The mesenteric glands were considerably enlarged.

CASE 3.—Private J. McM., Company F, Nineteenth Infantry, aged 23 years. Was admitted to the hospital August 26, 1896. He stated that he had been feeling badly for ten days, with headache, anorexia, muscular pains, and weakness. When first seen his temperature was 102°, pulse 110, compressible and dicrotic. Face flushed and anxious, tongue dry, brown, and fissured, and teeth covered with sordes. Spleen was considerably enlarged, abdomen tympanitic and tender. Bowels had been irregular since first taken sick, at times constipated, and at other times had had slight diarrhea. During the night of the day of admission patient became delirious, the delirium being of the muttering type. On the day following admission he began to vomit, was very restless, picking at the bedclothes, and delirium was more active in character; bowels constipated. On the next day no change was observed in his condition, except that his delirium became still more active, so as to require constant watching to keep him from getting out of bed. The unfavorable symptoms gradually increased in severity, the vomiting became uncontrollable, pulse became more rapid and feeble, delirium and stupor alternating, and he died on the morning of the seventh day after entrance. A slight eruption of rose spots appeared on the abdomen on the day before death which appeared to be due to exhaustion. In this case the result

might have been different had the patient presented himself promptly on the appearance of the disease.

Autopsy (seven hours after death.)—Rigor mortis present. Body extremely emaciated. For certain reasons chest was not examined. Spleen was enlarged about three times the normal size and greatly softened. On section the spleen pulp was almost black in color and diffluent. The peritoneal surface of the small intestine was deeply injected, presenting in patches a dark purple color corresponding to the ulcerations found on the mucous surface. The small intestine contained yellowish fluid, and for a distance of 3 feet or more from the ileo-cæcal valve was the seat of enlarged and infiltrated solitary glands and Peyer's patches and ulcerations, varying in size from 1 to 2 cm. The ulcerations had sharply defined edges with uneven bases and in spots were covered with black and coagulated blood. The ascending colon likewise contained numerous ulcerations and enlarged solitary glands. The mesenteric glands were firm and greatly enlarged, especially those situated in the mesentery near the ileo-cæcal valve, some of which were as large as pullet's eggs. The mucous membrane of the stomach was injected and inflamed. Liver and kidneys apparently normal. Cultures from the spleen gave pure growths of the typhoid bacillus.

CASE 4.—Private H. D. L., Company F, Nineteenth Infantry, aged 30 years, was admitted to the hospital on the evening of August 26, 1896, complaining of headache, pain in back and limbs, and dizziness and chills. He stated that he had been suffering from these symptoms and cough for seven or eight days. On admission he had a temperature of 102°, pulse about 100, of good volume and force. Cough was dry and hacking, without expectoration. Bowels loose; tongue coated, but moist; abdomen tympanitic, spleen enlarged. Examination of lungs at this time was negative. Two days after admission, patient began to have profuse muco-purulent expectoration, occasionally streaked with blood. Examination of chest now showed a patch of consolidation in lower lobe of right lung, posteriorly. Morning temperature 102°, evening temperature 103°. On the third day after entrance he had a profuse nosebleed. Cough continued to be very troublesome, and during the day he had two copious pea-soup stools. Two days later patient became delirious. Abdomen was now markedly tympanitic and very tender on pressure in right iliac fossa; diarrhea slight, but characteristic; face dusky; pulse more rapid and feeble; coughing almost incessantly when awake, expectoration bloody. A well-marked eruption appeared on the seventh day after admission. On the ninth day after admission he had another nasal hemorrhage, a profuse sweat on the tenth, and a severe chill on the twelfth day after admission, respectively. His condition now became much worse, movements of the bowels became more frequent, some of which were passed in bed; abdomen tense and very tender on pressure; he was constantly delirious except immediately after coming out of the bath tub; pulse small, rapid (from 110 to 120), compressible, and dicrotic; subsultus tendinum marked; tongue brown, dry, and fissured; sordes on the teeth, and respiration shallow and frequent (36 to 40). On the morning of September 10, sixteen days after admission, he had a large stool which contained a considerable amount of liquid blood. He had no further movement of the bowels until the following day, when he had several chocolate-colored stools, but none which showed any signs of fresh bleeding. Baths were discontinued immediately after the bloody stool, and his condition now became extreme. Delirium became more marked; respirations were more shallow and rapid (50 to 60); cough still persisting but ineffective; pulse 120, and gaseous in character in spite of free stimulation. He was able to take his nourishment and alcohol, however, though his condition was becoming gradually worse. Bowels were still loose but stools contained no evidence of blood. Two days after the first appearance of blood in the stools his morning temperature was 103.2°, and his condition appeared desperate. Cold tub baths were now again begun and he immediately showed some signs of improvement. His delirium quieted down and he slept soundly for an hour or two after the first bath. Respiration became less frequent (40), and pulse though still rapid became fuller. Baths were now prescribed again whenever indicated, and improvement became more marked; bowel movements soon became less frequent; delirium gradually disappeared; respirations became deeper and less frequent; cough was less troublesome, the pulse diminished in frequency and improved in quality, and on September 19, the twenty-fifth day after admission the morning temperature reached the normal. Slight fluctuations occurred for some time after this date, but he continued to improve, though the cough persisted for about a week longer, and the pulse remained rapid for a much longer period. He remained very weak for a long time after convalescence had been fully established, and was not able to sit up until nearly two months after admission.

The above histories are of the severer cases. The following are examples of milder types:

CASE 5.—Corporal J. M., Company F, Nineteenth Infantry, aged 40 years, was admitted to the hospital August 23, 1896. Two days before entrance he began to have chilly sensations, followed by fever and sweating. The day before admission he had

some pain in bowels, accompanied by a slight diarrhea and nausea. On admission he complained of headache, pain in back and limbs, and anorexia; tongue moist and coated; abdomen tympanitic and slightly tender on deep pressure in right iliac fossa; spleen slightly enlarged. Morning temperature, 99°; evening temperature, 102°. During the next two or three days he complained of chilly sensations, with slight headache; bowels were loose, discharges thin and light colored. On September 1, the ninth day after admission, rose spots were noted over the abdomen, which was still tympanitic and tender on pressure. Diarrhea soon ceased; headache disappeared; and temperature, which had at no time exceeded 102° and which was distinctly remittent in character, reached the normal on September 7, the sixteenth day after admission, and practically remained so afterwards. Abdominal distension remained for a few days longer, and patient made a speedy convalescence.

CASE 6.—Private E. H. W., Company F, Nineteenth Infantry, was admitted to sick report August 29, complaining of having chilly sensations and sweats, with headache and constipation. Temperature normal. During the next two days he expressed himself as feeling much better, but without any appetite. Temperature morning and evening remained normal. On September 1 he was admitted to the hospital. Morning temperature normal; evening temperature, 100°. On admission abdomen was markedly tympanitic, but without any tenderness on pressure in iliac fossa; bowels constipated; spleen enlarged; pulse not accelerated and of good volume and force; tongue moist and coated with a white fur. Patient complained only of a slight headache. On the second day after admission to the hospital the evening temperature had risen to 103°, the morning temperature having been normal. He was bathed in the tub, the only bath administered to him. Shortly after this time his headache had disappeared and he expressed himself as feeling well. On September 7, the ninth day after admission to the sick report, a characteristic eruption, distributed over the abdomen and lower portion of the chest, made its appearance. Two days later he was apparently convalescent. He had had no morning elevation of temperature throughout the attack, and no diarrhea. Tympanites persisted for some days after, and the spleen did not return to its normal size for more than two weeks after his fever had entirely disappeared. On September 23, twenty-five days after coming on the sick report, his diet was increased by eggs beaten up in milk (which latter had been his sole article of diet). The evening temperature rose to 102°, and the abdomen again became tympanitic, though no diarrhea was present. Within twenty-four hours thereafter the temperature reached the normal again, and patient had no further trouble and made a rapid and complete recovery.

Of the 16 cases, 7 were severe, 5 were moderately severe, and 4 were mild. The spleen was enlarged in all cases. The eruption was present in 11 cases, in the other 5 it had not been observed. Catarrhal pneumonia was present in 3 cases, bronchitis occurred in all the severe cases, and in 3 of the moderately severe cases; in the others it was absent. Chills and sweats were noted in 7 of the cases; diarrhea was present in 10 of the cases; intestinal hemorrhage occurred in 2. Phlebitis of the external saphenous and popliteal veins occurred once. In this case, the patient had passed through a moderately severe attack and was apparently convalescing, the temperature having been normal for four days, when he complained of intense pain in the calf of the leg and inability to flex the limb. Examination showed the upper portion of the external saphenous and the popliteal veins to be hard, swollen, and exquisitely tender. The temperature rose to 104°, and remained elevated for several days, then became remittent, and after a week from the beginning of the attack reached the normal. Suppuration did not follow, and though more or less tenderness remained for some time he made a complete recovery. One patient who had passed through a mild attack of the disease, three weeks after convalescence had been apparently fully established, developed a persistent and almost continuous tachycardia. The heart was apparently normal, there was no digestive disturbance whatever, no tobacco poisoning, and there was no marked anæmia. The patient complained of sleeplessness and smothering sensations in the chest. The pulse rate varied from 120 to 150, and at times was irregular. When the rate was at its highest a systolic murmur, soft and blowing in character, was heard near the apex, which was not transmitted to the vessels of the neck. This murmur disappeared when the heart's action became slower. At the date of this report, October 27, patient has improved somewhat; the sleeplessness and smothering sensations have disappeared; the heart's action is slower (80 to 90), though still prone to run up to about 120 with the slightest excitement, and it is still irregular at times, while the murmur is no longer detected. Relapses occurred in 3 cases. In 2 of these a second eruption appeared; in the other case no eruption was observed either in the primary attack or in the relapse.

In the treatment of these cases up to September 1, whenever the temperature of the patient rose above 102.4° he was sponged with cold water. After that date the Brand treatment was instituted. Temperatures were taken every three hours, and

whenever the thermometer recorded 102.4° or over the patient was placed in the bath tub with water at about 75°, which was gradually reduced to 70° by allowing cold water to flow into the tub. While in the tub the patient's limbs and chest were vigorously rubbed by the attendants, and cold water poured upon the head. As soon as he began to show chilliness, as evidenced by chattering of the teeth, which occurred in from ten to fifteen minutes, he was given 15 c. c. of whisky, lifted out and quickly dried, and placed in bed and well covered. All the patients bore the bathing well; the temperature would fall from 2° to 4°, the pulse become slower and stronger, the delirium would disappear, and the patient would fall into a refreshing sleep. Only exceptionally would the temperature rise again to the bathing point within the next three hours. No ill results whatever were observed from this method of treatment. When constipation existed the patient was given small doses (0.032) of calomel, repeated every two hours until the bowels moved freely. When the pulse became rapid, frequent and compressible, strychnin and alcohol were administered. For the sleeplessness sulphonal in gram doses was administered, usually with good effect. The diet during the febrile stage was milk exclusively. This was supplemented by eggs beaten up with the milk after the temperature had remained normal for eight days. If this did not give rise to disturbance, bread soaked in milk was tentatively added, then soft-boiled eggs, and finally meat. Patients did not receive full diet until the temperature had been at the normal point for at least three weeks. It should be added, to complete the history of this outbreak, that a bacteriological examination of the suspected water by Elsner's method was attempted, but no results were obtained, owing to the rapid liquifaction of the gelatin by what appeared to be the bacillus subtilis.

[Remarks of Deputy Surgeon-General Brown.]

Referring to the 4 cases of typhoid fever (Nos. 2839, 2840, 2850, and 2851) treated at this post in September and October, 1896, after careful study of all the attainable facts, I am of the opinion that the point of infection was the target camp near Rexford, Mich. In support of this opinion I submit the following, which I have obtained from different sources: About July 4, 1896, Companies B and D, Nineteenth Infantry, arrived and made camp preparatory to target practice. The camp selected was on the site of that of 1895. This camp was on or near the top of a sand ridge, with the slope of the ground toward the lake. This lake (pond) was one of a chain, but disconnected, was fed by springs from the bottom, and has no outflow, at this time being evidently 2 feet below the usual level. Sinks were dug near the kitchens for refuse. Wells were opened about 15 feet from the water's edge in front of the camp. Vaults were dug back of the camp on the other slope of the ridge. These two companies remained at this camp about three weeks, during which time the weather was clear and very hot. They returned to Fort Brady about July 18. About July 23 Companies C and F arrived from Fort Brady and occupied the same camp. About the time of their arrival there was a very hard rain. These companies remained about two weeks and returned to the post, reaching there August 7. Shortly after, typhoid fever broke out, 10 cases being in F company. These companies made the return march in two days. After leaving camp, while on the march, a halt was made at the railroad tank, and of the 10 men all drank this water. During the next day's march the first halt was made at a small brook running out from a marsh, and at this place but 8 of the men drank. Continuing on, the next halt was made at a spring, and here 9 of the 10 men drank. The next stop was at the post. In addition to these 10 cases the son of one of the officers of Company F visited him in camp for about five days and returned to the post, going and returning by rail. By a study of the foregoing it will be seen that all these persons drank of the water at the camp and at Fort Brady. The infection could not have been at the post for the reason that the other companies using the same water and living under the same conditions had no cases, supposing the young lad to have been exposed to the infection at some place other than the camp. It appears that at four places the 10 enlisted men drank of the water. Inquiry has been made since, and no fever existed in the neighborhood of two of these places before or since. I am forced to exclude the other two halts as points of infection, as part of the men did not drink of the water. From all these facts I conclude that the point of infection was the target camp, and that the immediate cause of the contamination of the water was the heavy rain which washed the refuse of the camp into the lake (pond). I am advised that it is not infrequent in Michigan for typhoid fever to follow heavy rains, as they police the ground and wash refuse into and thus pollute the streams.

The frequency of outbreaks of low fevers in troops operating in the field has led many medical officers to caution their commands against the use of contaminated water. The following, by Capt. John L. Phillips,

assistant surgeon, Fort Walla Walla, Wash., is an illustration, and in this connection the practicability and advisability of carrying portable filters with such commands, as represented in letter of Deputy Surgeon-General Smart (infra p. 160), is of interest.

[Extract from recommendations of Captain Phillips.]

That care be enjoined upon the command going into the field to-morrow from this post against the indiscriminate drinking of water. There is typhoid fever all through this country, and in the majority of instances the disease is contracted by drinking water contaminated with typhoid dejecta. Water from streams running through or near by towns or a thickly settled country is particularly liable to contamination. A very good plan is to have the cooks each morning before emptying their coffee pots pour fresh water on the coffee grounds, boil it for half or three-quarters of an hour, and allow the men to fill their canteens with this before starting out on the day's march.

SERUM DIAGNOSIS IN TYPHOID FEVER.

With the view of aiding in the diagnosis of doubtful febrile cases and of determining at the same time the diagnostic value of Widal's serum test in cases of typhoid fever, medical officers were requested to forward to this office samples of blood from cases of fever, together with a clinical record of each case to date, and to follow these with a special report of the further progress of the case on its completion. Microscope slides in slide boxes were sent to each of the posts with directions for obtaining and mailing the samples of blood. On the arrival of each sample at this office it was sent to Dr. Walter Reed for examination at the bacteriological laboratory of the Army Medical Museum. The clinical records were not submitted to Dr. Reed, but were retained in this office for consideration in connection with the laboratory results reported. The diagnostic method adopted was that brought into practical use by Dr. Wyatt Johnston, of the provincial board of health of Quebec. This method depends on the action of a weak aqueous solution of the suspected dried blood upon a culture of the typhoid bacillus grown in a liquid medium. According to Dr. Reed:

The particular fluid medium selected was old 1 per cent glucose bouillon, which proved so favorable with each of the two cultures on hand that no other medium has been substituted therefor.

A tube of such glucose bouillon is planted with a culture of the typhoid bacillus, which, as a rule, has grown on agar for several weeks. At first the inoculated tube was grown at a temperature of 37° C. for eighteen to twenty-four hours, but as experience has shown that a loop taken from the deeper part of such tube often contains already small masses of agglutinated bacilli, it was decided to keep the fluid culture at room temperature. The latter not only eliminates the danger of previous clumping, but serves to keep the bacilli in good motility for three to five days, which is not the case with thermostat cultures.

The drop of dried blood is moistened at its margin with sterilized distilled water, so as to obtain a pale straw-colored solution. This is transferred, by the loop, to the center of a clean cover slip which has been well flamed. Generally the contents of two loops are transferred and immediately thereafter an equal quantity of the fluid culture, whose motility has been previously tested, is carefully mixed with the blood solution. The drop is then examined with a dry lens, one-sixth, to observe motility and agglutination.

The time adopted within which the reaction should be complete was one hour. This seemed advisable, as observers were differing so much in opinion as to the exact time limit within which the reaction should be complete. Practically in only two cases has the reaction appeared as late as nine minutes, and in these cases was complete after twenty minutes.

If all motility has ceased and the majority of the bacilli are gathered together in large or small masses at the expiration of one hour, the case is reported as giving a *positive* reaction.

If agglutination of half or two-thirds of the bacilli has occurred, while there are still to be seen a few motile bacilli in all fields at the end of one hour, the reaction

has been designated as *partial* or *incomplete*. While the case is considered to be probably one of typhoid fever, a second sample of blood, at the expiration of one week, has been asked for.

If agglutination is present to some extent only around the margin of the drop, while the nonagglutinated bacilli retain their motility, the case is reported as one giving *doubtful* reaction. The case is considered to be possibly one of typhoid fever, and a second sample is asked for at the end of one week.

If there is present at the end of one hour active motility and no clumping, the reaction is reported *negative*.

The test has been made in each case with the greatest care so as to avoid any incorrect observation, and as the examiner has been quite ignorant of the clinical history of the cases, his observation has been purely subjective and his opinion absolutely unbiased.

The cases reported from the various posts were as follows:

Fort Adams, R. I.—From 1 case negative results on two occasions; plasmodium recognized in the blood; prompt cure by quinin. Case clinically recognized as æstivo-autumnal fever.

Fort Barrancas, Fla.—Eight cases. In 5 positive reactions were obtained, the earliest on the eighth day. In 1, doubtful, on the tenth day and in 2 incomplete on the seventh and eleventh days, respectively; but these gave positive reactions one week later. In none of these cases was any diarrhea present or eruption discovered, and in only 1 was there tenderness in the right iliac region. The cases were reported by the surgeon as good examples of the continued fever of Florida, which he regards as a mild typhoid.

Fort Bliss, Tex.—Seven cases were examined. One gave negative results on two examinations, a remitting fever in a man who died two months afterwards of acute miliary tuberculosis. A case recognized clinically as a remittent fever amenable to quinin gave a slight agglutination at the end of an hour, but active motility continued at the end of seventy-five minutes. In 2 cases reported as Texas fever positive reactions were obtained from blood drawn on the ninth and tenth days. This fever was described as like typhoid, but without the abdominal symptoms. Several other similar cases were in the hospital at the same time under the diagnosis of fever of undetermined causation. Three other cases sent on August 11 gave prompt agglutination and loss of motility. Clinically, one of these was regarded as typhoid fever on account of the abdominal symptoms, but the other two were recorded as Texas fever.

Fort Brady, Mich., furnished blood from 1 typical typhoid case, which, taken on the sixth day, gave a positive reaction.

Fort Brown, Tex.—Two cases from this post gave negative results on two examinations at intervals of twenty-one days. The surgeon called these cases typhoid fever, but the clinical data did not sustain him in his diagnosis. In one case, which was under treatment for twenty-seven days, there was merely a slight bronchitis, and in the other, which was under treatment for sixty-eight days, the glands in the groin became inflamed and suppurated.

Fort Clark, Tex., furnished 1 case with a positive reaction from blood drawn on the fifteenth day, but there was no pathognomonic symptom of typhoid. The malarial parasite was not present.

Fort Custer, Mont., furnished 2 cases of special interest. In the first a negative reaction was obtained from blood drawn on the twenty-second day. A similar result was obtained by Dr. Howard at Fort Custer, but with serum from a blister he obtained complete immotility and marked agglutination in a bouillon culture twenty-four hours old. Erlich's diazo reaction was present; the malarial parasite was not discovered, and quinine had no specific effect. There was some tympanites

and a tenderness over the whole of the abdomen, with relaxed bowels. On the thirty-fifth day of the illness, the eruption of measles appeared. The patient, a colored man, was under treatment fifty-five days. The second case throws light on the earlier one. The patient was the hospital corps member who nursed the previous case. The blood sample was taken two days before the unfortunate man died. There was agglutination, and the post-mortem appearances were those of typhoid fever.

Fort Ethan Allen, Vt.—One case gave negative results on two occasions, the diagnosis from clinical observation being malarial fever.

Two blood samples were sent from the *Army and Navy General Hospital, Hot Springs, Ark.* One, from a typical case of typhoid fever, gave positive results; another, from a case of traumatic hysteria, gave negative results.

Fort Leavenworth, Kans.—Two examinations of one case gave negative results, the clinical data indicating malarial fever.

Fort Logan, Colo.—Blood drawn from a convalescent on the ninety-seventh day gave positive results. This was a well-defined case of typhoid fever.

Madison Barracks, N. Y.—Two samples at an interval of ten days gave negative results, the clinical data indicating a case of chronic gastroduodenitis.

Fort McPherson, Ga.—A positive result was obtained in one case in which the disease was called remittent fever. The man came on sick report December 16, 1896. Temperature 104.2°, with slight oscillations. The febrile action subsided on the 25th and the patient was returned to duty January 3, 1897. On the 12th he had an accession of fever, 105°, which gradually subsided, his temperature reaching the normal on the 25th. He remained free from fever until February 10, when the temperature again rose to 105° and was in progress of falling, when on the 16th the diagnosis was changed to typhoid fever primarily because of the positive results of the blood test, but also because another man similarly affected had died and the post-mortem examination had shown typhoid ulcerations. Two other cases at this post gave positive reactions with clinical support of the cases as being cases of typhoid fever.

Fort Meade, S. Dak.—One case gave a positive result, with blood drawn about the thirtieth day. The disease was believed to have been contracted in San Antonio, Tex. The symptoms were not marked.

Fort Myer, Va.—In one case a positive reaction was obtained on the fifth day. The symptoms were not characteristic, but death took place on the twelfth day and the lesions of typhoid fever were found post-mortem.

Fort Niobrara, Nebr.—Three cases were examined. One gave positive results and its clinical history indicated typhoid fever. One gave negative results and was afterwards regarded as a case of influenza. The third case gave negative results on the nineteenth and twenty-third days of the attack. The patient, a boy 12 years old, was said to have had an attack of typhoid fever at Fort Yates in 1890. The clinical notes furnished by Dr. Fauntleroy in this case, February 15, 1897, were as follows:

January 28, I found the patient with a temperature of 102°; pulse rapid and weak; constipated; extremities cold; pallor and general weakness marked. For the week prior to my visit patient had shown a decided loss of appetite, aversion to his food, and also little of his usual interest in outdoor exercise. He was given calomel and salts and put to bed; milk diet. For the next week his temperature ranged from 101° to 102° in the morning, and from 103° to 105° in the afternoon. At this time he had nosebleed every day; his pulse was weak and intermittent. On February 4,

rose-colored spots were noticed on the lower portion of the abdomen. His bowels were kept open by enemata and occasional doses of calomel. Strychnin sulph. 1 mgrm. was given three times daily; milk 60 cc. and whisky 4 cc. every two hours. Sponge baths were ordered for temperature of 102° or over, together with ice cap. Temperature has gradually declined, and since February 13 has been 98.6° in the morning and 99.4° in the evening. Pulse ceased to intermit; whisky was stopped and milk increased on February 14. Patient was delirious every night from February 1 to 8. He is gaining strength every day now and showing a decided interest in his surroundings. Excreta and clothing have been disinfected throughout.

Plattsburg Barracks, N. Y.—One case yielding negative results; diagnosis, from clinical study, cellulitis in which pelvis of right kidney is involved.

Blood from a typhoid fever convalescent at *Fort Reno, Okla.*, about the seventieth day of the disease gave positive results.

Fort Riley, Kans.—In one instance giving negative results the patient died afterwards of acute tuberculosis. In another instance, which gave negative results on two occasions, the onset was suggestive of perforative appendicitis followed by general peritonitis.

Fort Sam Houston, Tex.—Six cases were reported by the post surgeon as cases of typhoid fever, although in but one of them was any characteristic symptom mentioned. Blood from 2 of these cases drawn about the twelfth day gave positive results. In one of the 4 other cases the report on blood drawn about the tenth day was:

It gives a reaction which is not quite complete at the end of one hour, although arrest of motility together with agglutination begins within two minutes and is well marked after the lapse of fifteen minutes; still, there are some motile bacilli to be seen even at the expiration of one hour.

The case may be accepted as one giving a positive reaction. In two cases blood drawn from one about the thirty-fifth and from the other about the forty-seventh day gave what were considered to be doubtful reactions. There was arrest of motility at the end of an hour, but scarcely any agglutination. Samples from these cases sent two weeks later gave positive results. Lastly, in the sixth case blood drawn on the twenty-seventh day gave negative results. Request was made for another sample if the patient still had fever. Unfortunately, no sample was sent, as by the time the request was received the patient had ceased to have fever. The clinical notes furnished by Dr. L. M. Maus with this case were as follows:

CASE 8649.—Age, 24. Admitted December 2, 1896. Temperature at 5 p. m. of that date, 103°; pulse, 78. He had slight chills December 1 and 2, followed by more or less fever mornings and evenings. Temperature at 5 p. m. December 27, 99.8°; pulse, 64. Fever ceased January 2, 1897; returned to duty January 10. No typical symptom of typhoid fever during illness. Diagnosis: Typhoid fever of a mild form.

Fort Sheridan, Ill.—Blood from 2 cases of well-defined typhoid gave prompt positive reactions. Similar results were obtained from 2 convalescent cases at *Fort Slocum, N. Y.*, and from 2 characteristic cases at *Fort Snelling, Minn.* In one of these the blood was drawn on the fourth day of sickness.

Fort Thomas, Ky.—Positive results were obtained from a typical case on the ninth day and negative results from blood drawn on the sixteenth day of a case which had been treated as malarial fever prior to admission into hospital. Dr. W. H. Gardner reported of this case:

The symptoms were undoubtedly those of typhoid fever, and not only were the symptoms markedly typhoid, but for three days consecutively he had taken 2 grams of quinin without influencing the temperature, which rose to 104° in the evening. I had on hand, for private use, Dr. Woodbridge's medicines for typhoid fever, and placed the patient on the treatment with the result that by the end of two weeks the typhoid symptoms disappeared, and it was just previous to this time that the sample of blood was drawn and sent for examination.

Vancouver Barracks, Wash.—Negative results were obtained in a case of lobar pneumonia.

Fort Warren, Mass.—A case which gave a positive reaction on the fifteenth day of the fever was, apparently from that very fact, entered on the register as typhoid. It had been treated at first as malarial fever.

Washington Barracks, D. C.—Samples of blood from 7 cases were examined. Two cases gave positive results on the first examination, the sample taken on the fourth day in one case and on the twenty-second in the other. Both cases were recognized clinically as typhoid fever. In a third case blood drawn on the fourth day gave a fairly good reaction in twenty minutes, but at the end of an hour some bacilli continued motile. A second sample drawn one week later gave positive results, and the progress of the case indicated the existence of typhoid fever. Four cases gave negative results; two of these were recognized clinically as malarial fever and two as pneumonias.

One case at *Fort Wayne, Mich.*, which gave negative results was regarded as continued malarial fever.

A febrile case at *West Point, N. Y.*, gave negative results on the seventh and thirteenth days. Dr. Torney reported this case as simple continued fever.

Whipple Barracks, Ariz.—Positive results were obtained about the seventh or eighth day of a case regarded clinically as typhoid fever. In a second case the reaction on the fifteenth day was incomplete, but positive results were obtained from blood on the twenty-eighth day. In a third case, clinically similar to those already mentioned, an incomplete reaction was observed on the seventh and twentieth days; but on the thirty-fourth day, or eleven days after convalescence had set in, a negative result was obtained. In a fourth case which presented chilliness, malaise, diarrhea, with some gurgling, blood taken on the third day gave negative results. The patient was returned to duty on the eighth day.

Fort Yellowstone, Wyo.—Blood drawn on the sixth day of a well-marked typhoid-fever case gave a positive reaction.

Summary.—Observations were made on the blood of 71 cases of disease. These were instituted with the view of determining the value of the test; but by many medical officers this value was accepted and the observations were regarded as tests for the presence of typhoid fever.

In 27 well-defined cases of typhoid fever positive results were obtained in 25. A negative result was furnished by one case at Fort Custer on the twenty-second day; but positive results were obtained in this case from serum of a blister. In a case at Whipple Barracks incomplete reactions were followed by negative results.

In 19 cases of well-defined diseases, not fevers, negative results were obtained.

From the results in these 46 cases a positive reaction would be strongly suggestive of the presence of typhoid, while a negative would require to be sustained and verified at a later date to show that typhoid was probably not present.

There remained 25 febrile cases in which observations were made. In 19 of these the symptoms of typhoid fever were not characteristic. In fact they were with one exception cases of so-called Florida fever and Texas fever; but each of these cases gave positive reactions in the laboratory, and it is extremely probable that they were in fact cases of typhoid infection.

In four of the remaining cases the reactions were negative, one case

each at the posts of Fort Niobrara, Fort Sam Houston, Fort Thomas, and West Point. The cases are described above.

The single remaining case regarded clinically as a remittent fever and amenable to quinin was the only case of fever not probably typhoid in which a doubtful reaction was obtained.

MALARIAL INFECTIONS.

The admission rate for malarial infections for the year was 83.08, and the rate of noneefficiency 1.65, as compared with 82.56 and 1.70 in 1895, and with 96.67 and 2.48 as the average of the decade 1885-1894. The total number of cases was 2,087, of which 1,771 were intermittents, 297 remittents and continued malarial fevers, 1 pernicious, and 18 registered as malarial cachexia. One death and one discharge were occasioned by these diseases. The admission rate for the colored troops was 16.63; for the white troops, 89.16.

The Department of the East had the largest number of cases, 175.18 per thousand of strength. None of the other departments exceeded the Army rate of 83.08. The Department of Dakota had the smallest rate, 18.43. Texas, in which some years ago these infections were very prevalent, had a rate of only 34.78. The posts which had high rates were mostly eastern posts, Washington Barracks, D. C., and Fort Myer, Va., being at the head of the list with 1,071.22 and 644.37, respectively, giving 9.82 and 5.83 of nonefficiency. Jefferson Barracks, Mo., followed with 356.52, and the high nonefficient rate of 16.05. These cases are described below. West Point, N. Y., had an admission rate of 317.59, and Fort Slocum and Willets Point, N. Y., Fort Monroe, Va., and Fort Wadsworth, N. Y., had rates of over 200 per thousand. Fort Sill was the only western post that had a rate (290.64) approaching those found at these eastern stations. Forts Clark and McIntosh, Tex., which formerly had large rates, reported during the year only 13.48 and 16.81 admissions, respectively, per thousand of strength. Even Fort Brown had only 90.09, and Fort Ringgold 103.17.

The epidemic which prevailed at Jefferson Barracks, Mo., had its origin at the rifle range, Arcadia, Mo. Asst. Surg. Charles B. Ewing reported that all his fever cases at Arcadia were cases of malarial disease, with no indication of the presence of a specific typhoid infection, although in two cases he acknowledged having seen an eruption resembling the rose spots of this fever. Many of his cases when under treatment subsequently at Jefferson Barracks were found to be distinctly cases of specific typhoid, there being even post-mortem evidence as to the condition of Peyer's patches and the mesenteric glands. Special reports from Arcadia and Jefferson Barracks were rendered as follows:

SPECIAL REPORT FROM ARCADIA, MO.—This report embraces a period extending from June 14 to September 8, 1896. The troops in camp were officers and men of B, D, H, I, and K, Third United States Cavalry, who were at target practice during the time specified. Three troops, B, I, and K, consisting of 122 officers and men, were at the range from June 14 to July 31, while the officers and men of troops D and H, 82 in number, were in camp from August 8 to September 8. A report upon the physical aspects of the present and that of the prospective range was made some time since, hence will not now be considered.

The febrile diseases which affected the troops were of two kinds, viz, simple continued and malarial fevers, though one case continuing sick during my temporary absence from camp was transferred to the hospital at Jefferson Barracks, presenting certain symptoms not unlike incipient typhoid. This case passed from my observation, though it would have been observed by me in its entirety if it had not been in the person of an acting hospital steward, which made it necessary to have one of like grade to perform his very necessary duties. An examination of the blood made on the day of his transfer, and more hurriedly than I should have liked, gave negative

results in so far as malaria was concerned. I understand that this patient was diagnosed later on as "remittent fever;" which case was the only one under my care that presented anything like initial typhoid symptoms, and being negatived, gives the camp a clear bill of health so far as this preventable disease is concerned.

Of the simple continued fevers there were three cases, which I may dismiss with this mere mention, as all were returned to duty after a very short stay in the hospital.

The malarial fevers.—Of these I noted 22 cases, distributed as follows: June 14 to 30, 1896, inclusive, 1 tertian malarial fever; July, 2 tertian malarial fever, 1 double tertian malarial fever, 1 æstivo-autumnal malarial fever; August, 7 tertian malarial fever, 5 double tertian malarial fever; September, 1 tertian malarial fever, 4 double tertian malarial fever. The temperatures of patients were taken every two hours daily between 6 a. m. and 9 p. m.

There were chills in 12 cases; chilly sensations in 5; headache, anorexia, and muscular pains in 5. Vomiting was noted in a few cases, though it may have been more general previous to entrance. Epistaxis was seen in 2 or 3 cases. The bowels were regular in 14 of the cases, constipation in 6, and diarrhea in the remaining 5. The urine was normal in all of the cases except 1. This man complained of persistent pains in the lumbar region of the back during paroxysms, and a few weeks later developed a diffuse nephritis, as indicated by a high specific gravity of urine, a large quantity of albumen, and casts with marked œdema of the lower extremities and uræmic seizures at a later period. Hæmaturia was absent in all of the cases. Marked anæmia was observed in 3, and pallor of the red cells in 12. Herpes labialis was seen in 2 cases, and an eruption resembling the rose spots in typhoid fever in a like number; urticaria was noted in 3 cases. In a few patients bronchial catarrh of moderate degree was observed, as evidenced by substernal pain and slight hacking cough. It might be well to mention 3 cases (civilians) observed by me in the immediate neighborhood of the camp, all being males, white; 1 a boy of 16, and 2 in men between 25 and 30 years of age. One of the latter, a thin, sallow, markedly anæmic individual of 30 years, said that he had been "chillin' for a year," and hoped to effect a cure by drinking large quantities of spring water. I found upon examination a readily palpable spleen and marked jaundice, as indicated by the yellowness of the skin and scleræ. He complained of great weakness and faintness upon exertion. He had recently returned from the swampy region of Arkansas, where he had been at work for some months.

Besides the 15 charts submitted, representing three-fifths of the number seen by me in the camp at Arcadia, I respectfully submit, through the kindness of Maj. J. B. Girard, the thermographic charts of 6 cases of æstivo autumnal malaria which were treated by him in the post hospital at Jefferson Barracks. I was also kindly permitted to make one or more blood examinations in all of these cases, as well as in a number of cases of tertian malaria, one of which is of such interest from the intensely acute gastric symptoms presented, completely masking for the time the real trouble, that I shall make it the subject of special mention later.

The varieties of hæmatozoa observed and the methods used in their determination.—The method generally adopted was that of examining fresh blood, which has been found in an experience of some 70 cases to be by far the most satisfactory. In some instances cover-slip preparations were made after the plan of Ehrlich, and the blood fixed by heating on a copper plate at 150° C., or fixing by immersion in equal parts of alcohol and ether, and in some instances alcohol alone.

The staining methods used have been those of Chenzinzky and the modified Romanowsky, but not as a means of diagnosis. In my humble judgment, no method yet devised can improve upon the graphic pictures shown by the fresh blood, when seen through the aid of a No. 4 eyepiece and a one-fifteenth oil immersion objective with the aid of an Abbé condenser, and a very necessary adjunct, a mechanical stage, which I did not possess. I have never been satisfied with merely finding the immature hyaline plasmodia without pigmentation, but have persisted in my examinations as often as six or eight times daily, at intervals of an hour, until the pigmented forms have been found. In one or two cases the pigmented forms were so illusive, or so few in number in the peripheral blood, that it was only after a hunt of several days that I succeeded in finding them. For many reasons the lobe of the ear is preferable to the finger tip as the part from which blood should be drawn, though where much hair is found on this organ its usefulness for the purpose mentioned is partially destroyed. A preliminary washing of the part with warm water and soap should precede the thorough use of alcohol. Another very necessary work was the cleaning of cover slips and glass slides by placing them in acid, washing in water, and finally immersion in equal parts of alcohol and ether, or alcohol alone. My examinations were made with the Bausch & Lomb microscope furnished to the Medical Corps about two years since, no particular attention being paid to the use of the prepared slides of Hayem, as recommended by Piffard and others, as the ordinary cover slips furnished were used and found to subserve every purpose. Too much care can not be exercised in cleaning thoroughly the field of operation, and

the glass slides and cover slips used. A majority of the forms characteristic of the tertian and the æstivo-autumnal malarial fevers were observed by me in the cases cited. The parasite of the quartan form of malarial fever was not noted among the cases mentioned, neither seen in the entire 70 cases, from which I conclude that it is as rare in this section of the country as in Baltimore and its surroundings, where Osler has found only 4 or 5 cases in as many years. The flagellate forms were more frequently observed in the æstivo-autumnal than in the tertian types of fever.

From the microscopical appearances of the blood I was enabled to determine the presence of the malarial infection, as well as the species of fever, the type, and often approximately the severity of the attack. With regard to the species, I adopted the method of deciding whether the parasite found was to be placed in the first group which does not form crescents, or in the second group which does; or if a mixed infection in both groups. A double contour of the spherical bodies of the crescent series with their striking pigment granules should be, as a rule, readily differentiated from the larger pigmented endocorpuscular forms of the first group and more especially the tertian members of this group, and while there should be no difficulty in making a diagnosis between these tertian plasmodia on the one hand and the quartan and æstivo-autumnal upon the other, by reason of the very characteristic pigment granules of these organisms, yet as between the two latter, the pigment being equally black, I should think some doubt would arise, inasmuch as the crescentic plasmodium of the chronic or irregular malaria does not form until the seventh day, the temperature curve and the periodicity of the quartan type would give the clue, but it is not always easy to make a distinction between these forms until the crescent appears.

Phagocytosis was observed more particularly in connection with plasmodia of the æstivo-autumnal fever, and to a lesser degree among the tertians.

The accompanying anæmia was found to vary in the 25 cases studied, and in one case this was very marked, as shown by the blood count, but as a rule it was no greater than was to be expected in malarial diseases generally. It is certainly the most logical conclusion to infer that the accompanying anæmia is due to the destruction of the red blood cells by the plasmodia. A brief mention may be made of the different forms of the tertian and æstivo-autumnal hæmatozoa observed by me.

The tertian hæmatozoon.—Intra-corpuscular forms. (*a*) Small hyaline forms without pigment, very active. (*b*) Small hyaline forms with reddish-brown pigment granules, granules in active motion. (*c*) Two and three pigmented plasmodia in a single red blood cell, granules in active motion. (*d*) Plasmodia twenty-four hours old, pigment granules active. (*e*) Maturer forms with pigment granules motionless, just before segmentation. (*f*) Maturer forms with pigment granules central, motionless, radiating lines dividing organism into segments just previous to segmentation.

Extra-corpuscular forms. (*a*) Flagellate plasmodia where flagella, three to five in number, with knobbed ends and rapid lashing motion, pigment granules motionless, collected usually around center of body. (*b*) Spherical forms with motionless pigment granules scattered throughout the body of organism. These forms have been of various sizes, usually smaller than red cell. (*c*) Flagella seem to separate themselves from body of hæmatozoon and move through blood current. (*d*) Clumps or blocks of pigment (cadaveric?) seen in blood current in neutrophile leucocytes and seemingly limited to these. (*e*) Budding forms.

The æstivo-autumnal hæmatozoon.—Intra-corpuscular forms. (*a*) Small immature hyaline forms with double contour or central shading, rapid motion. (*b*) Small immature forms with very black pigment granules, and these in motion. (*c*) Multiple plasmodia seen in single red cells. (*d*) Spherical pigmented forms with black granules arranged around the center and in rapid motion. (*e*) Mature pigmented forms, granules black, lying in central mass, motionless. (*f*) Same as above, with pigment granules agglutinated in clumps or blocks, motionless.

Extra-corpuscular forms. (*a*) Mature plasmodia with formed segments and central clump of motionless black pigment. (*b*) Segmentation forms, broken up into segments or spores, and the pigment in blocks or clumps free in blood stream. (*c*) Crescentic forms, with pigment central, and in all cases motionless. I have never been able to find crescents in blood cells with protoplasm of the cell lying around it, as is portrayed by Thayer and Hewitson in their "Malarial fevers of Baltimore." (*d*) Crescent overlying part of blood cell, presenting the appearance graphically described by Manson as the "new moon with the old moon in its arms." It may be added that the new moon in such instances has lost much hæmoglobin. (*e*) Flagellated forms with knobbed flagella and motionless black pigment granules arranged around center of body of plasmodium. Phagocytosis also seen and limited to neutrophiles (polynuclear leucocytes).

The very hot weather, and the blood examinations being conducted in a tent where the temperature was usually at a high point for several hours daily, gave good opportunities for witnessing the amœboid movement in leucocytes and phagocytosis, although the examiner was usually in a perspiring condition.

In all cases the sulphate of quinin was used, and in the tertian and the double tertian forms of fever with a strikingly specific effect, though the æstivo-autumnal form was more intractable. Special mention should be made of 6 cases of æstivo-autumnal malaria seen at Jefferson Barracks. Through the kindness of Major Girard, I was permitted to examine the blood in these cases, and found the usual plasmodia characteristic of the irregular or chronic malaria. In 5 of the 6 cases my examination was made about four weeks after admission in hospital. During which time, as is shown graphically by the charts transmitted, quinin, iron, and Fowler's solution, also quinin in combination with iron, were given at various times. I found upon examination of the blood, September 19, 20, and 21 (about four weeks after entrance in hospital as stated), the plasmodium in its various forms, and in 5 out of the 6 cases, the crescent. These crescentic forms were still to be found in considerable numbers in some of the cases even after the temperature had become normal under the influence of the quinin. The case in which the crescents were absent showed a number of pigment clumps or blocks, which I believe to be the fragmented crescent, the mature crescent having disappeared under the influence of the quinin. The consensus of opinion seems to be in favor of the belief that each species of the malarial hæmatozoon has a biological cycle, and that the specific should be given during the developing phases of the life of the plasmodium rather than after it has matured, and further, that quinin should be in solution in the blood at the time of segmentation. This relates especially to the tertian types seen by me. In the æstivo-autumnal or chronic malaria even larger doses must be given and persisted in, especially as the life history of the hæmatozoon is not fully understood. Marchiafava and Celli strongly advise the giving of quinin in large dosage, say 32 grains in two doses at an interval of two hours, commencing an hour or two before the chill comes on. Hypodermic medication has yielded the best results, and should consist of quinin in large doses, especially in cases of pernicious malaria, where it should be pushed almost to cinchonism, if necessary.

The blood examination and diagnosis invariably preceded the use of quinin in all of the cases observed in camp at Arcadia, while some of the cases seen elsewhere had received quinin, which, while it negatived completely the blood examinations in the tertian forms, did not affect the plasmodium of the æstivo-autumnal type.

Malaria masked by acute gastritis.—This case was seen by me here at the post hospital, May, 1896, in the person of a sergeant of cavalry, of good physique, aged 25 years. He had been brought to the hospital on a stretcher for the second time within the short period of a week suffering from extreme general weakness, being unable to walk, together with persistent uncontrollable vomiting and pain over the epigastric region. I was kindly permitted to examine the blood in this case, and found very readily two generations of the tertian malarial plasmodium, which characterizes the double tertian form of malarial fever. Together with the symptoms enumerated the patient complained of slight coolness, but no marked chill. The vomiting was, as has been stated, persistent, finally yielding to remedies. Quinin was given without any return of the paroxysm. This case is cited as showing how malaria can be so completely masked as to make it necessary that blood examinations should be the routine rather than the exception in hospital practice.

Conclusion.—Finally I wish to state quite positively that the sanitary condition of the camp generally was good. As particular attention was paid to this feature and special care was given to the early determination of all febrile diseases, I can state positively that typhoid fever was not seen by me during any part of our sojourn in camp. It is still a vexed question as to whether malaria is a water-borne disease or an atmospheric, or a combination of the two; hence, not knowing its origin, we can not look upon it as preventable, except through the use of the specific quinin. While much has been said as to malaria being purely a water-borne disease, yet the part played by the atmosphere has not been entirely told. An illustration of the role the atmosphere plays has been graphically portrayed by a recent writer in the New York Medical Record upon the malarial fevers of Jerusalem. This city, he says, lies on a plateau 2,500 feet higher than the surrounding barren desert, the water supply coming entirely from cisterns; not a well or water course being found on this high tableland; yet the intermittent and the æstivo-autumnal types of malarial fever abound. The ingenious mosquito theory of Manson, while it has something to commend it, is still faulty, as the plasmodia were only found in the stomach of the mosquito and not in the blood, showing that the plasmodia had not passed through the walls of any part of the alimentary tract; hence, up to the present time this question is still sub judice.

To conclude, from my experience with cases at Camp Arcadia, Jefferson Barracks, and other places in this section, a total of about 70 cases, where the diagnosis of malarial fever was made by the blood examinations, I found the majority of cases of malarial infection due to the tertian parasite, and that these infections not only form the great majority of those that occur during the first half of the year, but occur throughout the malarial season.

The single tertian infection seems to afflict as many people as the double tertian, though the cases seen by me have been too few to warrant a statement as to general preponderance, so far as this section of country is concerned. These two groups of one biological form seem to go hand in hand up to August, when the aestivo-autumnal are seen largely in the majority. I have thus far failed to note a case of mixed infection.

SPECIAL REPORT ON THE FEBRILE CASES TREATED AT JEFFERSON BARRACKS, MO., DURING THE SUMMER SEASON OF 1896, BY MAJ. J. B. GIRARD.—The garrison of Jefferson Barracks consists of the headquarters, and Troops A, B, D, H, I, and K, Third Cavalry, a detachment of recruits of varying strength, under charge of 9 noncommissioned officers, borne on the post returns as Troop M, Third Cavalry, and a detachment of the Hospital Corps, to whom must be added 22 ordnance men attached to the St. Louis Powder Depot and receiving medical attendance at the barracks. There are also a variable number of general prisoners serving sentence in the post guardhouse.

The average health of the garrison during the spring months may be said to have been excellent; the sick list was chiefly made up of catarrhal affections, venereal disorders, and the injuries ordinarily met with at cavalry posts. Until the latter part of June, few, if any, indications of malarial or other toxic influences were observed upon the reservation.

The military authorities having effected the lease of a tract of ground for a rifle range at Arcadia, Mo., some 80 miles southwest of the barracks, on the line of the Iron Mountain Railroad, one-half of the garrison, consisting of Troops B, I, and K, organized as the First Battalion, were ordered to proceed to that place for their annual rifle practice, and left the post June 11. They were absent from that date until August 3, when they returned to the barracks. On August 5 Troops D and H left the post to go to and occupy the camp left vacant at Arcadia by the First Battalion, and were gone until September 13, when the whole garrison was again united. In the meanwhile Troop A had been ordered to Cleveland, Ohio, and was away from the post from July 18 to September 10.

During the absence of the First Battalion at Arcadia the troops left in garrison enjoyed relatively good health; some cases of malarial fever were, however, taken on the sick reports from time to time, though of no great severity or duration. The hospital records show for July twenty such cases, all but one short and easily cured, only 14 pertaining to the three cavalry troops, the rest scattered among the general prisoners and the ordnance men.

The First Battalion broke camp for their return march on the 31st of July. The weather had been for over a week intensely hot and oppressive, and remained so until August 15. Five men considered unfit for the march were sent home by rail and taken in hospital that day. On August 1, 6 others gave out, and reached the post in the same manner, all sick with fever; on the 2d 7 more, and on the arrival of the command at the barracks the following day, another squad of 6 men reported at the hospital for treatment. Thus far the admissions of febrile cases aggregated 24 since the departure of the battalion from Arcadia. From that time till the end of August additional cases of the same character kept coming in from day to day, bringing the total of fever cases furnished by Troops B, I, and K, between July 31 and August 31 up to 63 out of a command of about 125 men, a proportion of almost 50 per cent. None of the officers were affected.

By the beginning of September the epidemic seems to have exhausted itself among the members of the First Battalion, and they furnished no new cases during that month. The Second Battalion, after their return from Arcadia, contributed to the sick report some 14 cases up to October 1, since which time the disease has virtually disappeared from the garrison. On the 3d of October the greater portion of the command started on a 500-mile march, returning home on the 26th with almost a clean bill of health, while of the troops left in the post very few were taken sick, and most of the old hospital patients became convalescent and were restored to duty as soon as their strength permitted.

On the 1st of the present month, November, the sanitary condition of the garrison was, and has remained ever since that time, as satisfactory as during the spring months.

The disease, as observed on the return of the First Battalion from Arcadia, commenced in the same manner as ordinary malarial fever of the intermittent type, developing after a day or two into remittent or continued fever. Many of the cases were not seen in the first stage, as the men often kept away from the hospital in the vain hope of "working off" the disease, until they were no longer able to perform their duties. When admitted, they usually presented the symptoms of remittent fever, an abnormally elevated temperature, higher in the evening than in the morning, a pulse somewhat increased in rate, a slightly coated tongue, loss of appetite, feeling of lassitude, general weakness and discomfort; bowels in most cases inclined to costiveness, in a few others rather loose.

A few cases advanced no further than this stage and then with proper treatment began to improve, returning to duty after a week or two of illness. With the greater number, as time went on and the febrile state persisted, as it generally did, loss of strength and emaciation increased, sometimes very rapidly, and in a certain proportion of cases diarrhea set in which was difficult to control by remedies; the tongue became covered with a thick brown fur, the fauces dry and parched, the speech thick, and the facial expression listless. In the meanwhile the oscillations of temperature were of the wildest character; the curves on the temperature charts can not be reduced to any system or assimilated to any normal type of fever. Sudden rises and equally sudden falls are numerous and difficult to account for; in many cases the normal point would be reached and held for a day or two, and the patient would be thought to be convalescent, when, without ostensible reason, the temperature would rise again by degrees and in a week or so reach the same height as before, with the other abnormal conditions aggravated in proportion to the former debility of the sufferer. Asthenic and adynamic symptons of serious import would then set in and inspire fears for the ultimate issue of the case. The apathy and stupor increased, restlessness and insomnia tortured the patient, and at this stage his pulse would beat with increased rapidity and weakness, threatening death through failure of the heart's action. In two cases ending fatally the pulse was for days almost too fast and weak to be counted.

During a considerable time the writer, who has had much experience with malarial fevers in the western part of this country, considered the cases as of the same nature, until his inability to check the disease by means of the usual antiperiodic treatment led him to suspect some complicating morbid element; the existence of diarrhea and in two cases the occurrence of dangerous hemorrhages from the bowels convinced him that in a certain proportion of his patients, if not in the majority, the toxic element of typhoid was combined with that of malaria. From that time on a close search was made for the characteristic manifestation of the former affection and in some of the recent cases the rose colored spots on the abdomen were readily discovered.

The course of the disease, especially where both affections were undoubtedly combined, was exceedingly tedious and prolonged. Of the 63 patients furnished by the First Battalion during the month of August only 24 were sick less than ten days; the average duration of the illness was, in round numbers, four weeks, but the majority were sick much longer and a few remained on the sick report from two to three months, convalescence being very slow. The case whose intestinal hemorrhage gave the writer a clew to the nature of the disease, was admitted in hospital August 20, and at the date of this report is still unfit for duty. As weeks went by and the fever persisted most patients lost considerable flesh; men of average size fell from 40 to 50 pounds below their normal weight.

With the setting in of convalescence, a few patients were exceedingly annoyed by crops of abscesses in various portions of the body, chiefly the loins and hips, the face, and the axillæ. One case, apparently cured, of uncomplicated remittent fever, and with normal temperature an entire week, returned to duty and came back to the hospital the next day with typhoid fever.

Three cases proved fatal. The first, Private H. C., Troop I, Third Cavalry, was sick in hospital twenty-two days, from August 22 to September 12, but had been ailing some time before admission. His condition was not particularly alarming until the last four days, when the disease suddenly assumed a grave form, with the most serious abdominal and cephalic symptoms, ending in death. The autopsy disclosed extensively ulcerated Peyer's patches, and very much enlarged mesenteric glands. The next fatal case was that of Private P. H., Troop K, Third Cavalry, taken in hospital August 13. He lingered from this time on, with various degrees of fever, abdominal symptoms, intestinal hemorrhage, etc., until October 19, when he died of exhaustion due to his prolonged illness and an intercurrent attack of pneumonia. But for this complication he might have recovered, as he was free from fever and almost convalescent when the pulmonary difficulty supervened. The last case, Private G. E., Troop D, Third Cavalry, belonged to the second battalion, which returned to the barracks September 13. He entered the hospital the following day, and lay ill until October 28. In his case there were no manifestations of intestinal trouble, no abdominal pain or diarrhea, but a tendency to aggravated cephalic and nervous symptoms, impaired mental power, stupor, delirium, great restlessness, and subsultus tendinum. At one time he grew better, lost his fever, recovered his mental faculties, and was pronounced convalescent. Three days later he suffered a relapse, all the alarming symptoms returned, and he finally died from exhaustion.

Summary.—To sum up, out of the first battalion 63 patients were treated, of whom perhaps one-half were affected by both malarial and typhoid poisons, although the line could not be drawn accurately; 2 cases succumbed to the disease. The second battalion furnished but 14 cases, 3 of them distinctly typhoid, with one death, the rest of malarial character.

Troop A, on its arrival from Cleveland, contributed but 2 more cases of simple remittent fever. Among the troops that did not visit Arcadia, viz, the recruit detachment, general prisoners, ordnance men, etc., as well as among the civil population of the post, a number of fever cases broke out during the months of August and September, all of exclusively malarial nature of moderate duration and easily controlled by treatment, though inclined to relapses from time to time until the advent of frosty weather put a stop to them.

The last case of typhoid fever on the list is that of Private Peck, of the hospital corps, who, after nursing the sick with great zeal and self-denial, joined with hard work and loss of rest throughout the epidemic, himself contracted the disease, probably through contact, about October 12, and is now fortunately convalescent.

Treatment.—The treatment invariably commenced with small doses of calomel and bicarbonate of soda, followed by a mild saline purgative to relieve the portal circulation; then quinin, usually 1.700 in divided quantities, as soon as the bowels had been evacuated. The antiperiodic was repeated the following days in diminishing doses, 1 gram or 0.700 per day. The simple malarial cases yielded gradually to this treatment, but when it proved ineffectual other drugs were tried, such as Warburg's tincture, salol, etc., till the supply gave out, but with no better results. When the temperature rose above 104° the patient was immersed in a bath at ordinary bodily temperature and then cooled to about 75° F., when he was replaced in his bed with heat lowered, nerves quieted, and a feeling of great comfort lasting an hour or two. Antipyretics, such as acetanilid, antipyrin, phenacetin, failed to operate as effectually as the bath, but were considerably used to quiet the nervous system and to allay headaches. Chloral, sulphonal, Dover's powders, and trianol were regularly given to relieve the general tendency to insomnia; the last mentioned proved to be the most satisfactory where adynamic conditions predominated.

After the typhoid character of the disease was duly ascertained reliance was no longer placed on quinin except as an agent to reduce the excessive temperatures; all cases with abdominal symptoms were made to take three or four times daily an emulsion of gum arabic containing 10 or 12 drops of oil of turpentine to the dose, a mode of treatment that the writer confidently believes to be very satisfactory in typhoid fever. As the case lengthened and the patient's heart became gradually weaker, whisky or brandy was given in small but often repeated doses, besides a pill containg 0.070 of quinin and 0.001 of strychnin three or four times daily. The diet throughout the entire course of the disease was milk sterilized by boiling, broths, wine jelly, milk toast, and, when the appetite returned with convalescence, eggs, custards, and other light articles of food, tender meats, and potatoes well cooked.

Water, filtered and boiled, then cooled, was freely given; also lemonade when desired. In a number of cases where constipation existed rather than diarrhea the occasional administration of a mild mercurial followed by a laxative relieved the patient and was attended by excellent results. Intestinal hemorrhage was treated and apparently controlled by often repeated doses of acetate of lead and opium in the two cases where that complication supervened.

As convalescence set in the patients were put upon a course of bitter tonics when their appetite was poor, on iron and quinin or the mineral acids, according to the prevailing indications. A few patients obtained furloughs for twenty days to visit their homes, and returned to the post much benefited by the change of climate and surroundings.

Causation.—With regard to the causation of the disease, a forthcoming report of the medical officer (Dr. Ewing's report, submitted above) who attended the troops at Arcadia will give an account of the sanitary condition of the camp and of the morbid influences to which the men were exposed. The writer, from lack of personal knowledge of these conditions, is unable to formulate a decided opinion on the matter, but he wishes to invite attention to the following facts, viz:

(1) That a majority of the men were young and insufficiently inured to the fatigues of the service, and devoid of that experience which induces older soldiers to take better care of themselves and avoid the causes of disease.

(2) That the past spring was quite wet, and the troops were exposed to much rain and dampness in the camp luring the month of June.

(3) That the heat increased in July and reached a height such as had not been observed for a long time in this part of the country.

(4) That the return march of the first battalion was made while the weather was hottest, and that the men could not be prevented from drinking in excess any sort of beverage they could obtain on the way.

(5) That malarial fevers have, from all accounts, prevailed extensively all over this State the past summer, especially along the valley of the Mississippi River.

Under the circumstances, it is not surprising that many of the men should have contracted malaria in an aggravated form; and considering their inclination during the hot weather to drink anything they could get hold of, regardless of danger, their taking in of typhoid fever germs is readily accounted for.

The year at Fort Clark, Tex., according to a report by Surg. H. S. Kilbourne, was notable for the small number of fevers. Only 4 cases were treated, 1 each in July, August, September, and November. The first was regarded as a simple irritative fever, the cause of which was undetermined; the second as a relapsing malarial fever; the third as a mild remittent, promptly mitigated by quinin, and the fourth a continued fever without any observable complication, but with a protracted convalescence. Two slides with specimens of dried blood from the last-mentioned case were forwarded to the laboratory of the Army Medical School for diagnostic purposes, but in both samples the blood had been covered by a slip which had dried down and become fixed, so that it was impossible to make the examination.

Capt. Allen M. Smith, assistant surgeon, in reporting on the fevers that he had treated at Fort Reno, Okla., in 1896, described only 4 cases, 2 diagnosed as typhoid and 2 as intermittents. The latter were sent in from a command which had been on field service since August 21. One case, an officer, had chills at intervals of a week, with fever intervening. He reached the post October 20, when he had a continuous fever for a week, temperature ranging from 100° to 102.4°. The diazo-reaction was not obtained, but two intracellular tertian parasites were found in one of six slides examined. He recovered on quinin and laxatives. The other case, an enlisted man, had a chill October 18, and every succeeding day thereafter until he was admitted into hospital, November 1. No parasite was found in the blood examined during and immediately after the chills, but the diagnosis of malarial fever was made on an enlarged spleen and recurring chills followed by characteristic sweating, suppressed by quinin in an individual who had been exposed in a malarious district. The cases treated by Maj. S. Q. Robinson, surgeon, at Fort Reno, formed the subject of a special report by this officer. He shows that typhoid fever is rare, only 2 imported cases having been recorded during the year. The malarial cases were by no means numerous, particularly as compared with their prevalence in former years. Most of these cases were developed among the men of commands that had been on active service in the field, and as there was but little field service during the year this accounts in part for the lessened prevalence. His report is as follows:

At Fort Reno, Okla., 13 admissions for 9 individuals. Quotidian, 5; tertian, 4; single paroxysms, 4. The tertian cases did not appear until July, a reversal of the usual order, but the cases are so few that no inference can be safely drawn.

Chills or chilly sensations, followed by fever and sweating, without other discoverable causes, were the principal symptoms on which the diagnosis was based. Blood examinations were negative until December 3. This must be attributed to my lack of training, as from 6 to 10 specimens, fresh, and stained by the Romanowsky or Chenzinsky methods, were examined in each case. I had seen under instruction a few hyaline and segmenting forms, but not the intermediate stages. Even with plates and photographs to guide, perhaps the mental picture that I had formed, differing somewhat from the real, blinded me. Once recognized, it seems remarkable that they should have been overlooked, although in two stained specimens from Cases 5527 and 5542, both undoubtedly malarial intermittents, submitted to Major Reed, parasites were absent.

All patients were treated in hospital and confined to bed. Quinin was not given until the blood had been examined. If the time of the chill were known, 0.650 quinin sulphate or an equivalent of the bisulphate, three hours previously, the same or a lesser quantity in the sweating stage, after which 0.325 thrice daily for a week. The patient was usually directed to take a large dose on the seventh day.

The records were examined to show the relation between meteorological conditions and the prevalence of fever. (See Appendix A.) The departure from the usual rule that a wet season is an unhealthy one, in 1891, is explained by the large amount of detached service in that year. That the infrequent field service in 1896 does not alone account for the great reduction in the number of cases is shown by

civilian experience. The opinion expressed by Dr. Hatchett, superintendent of health for Canadian County (Appendix B), that there has been less fever of malarial origin this year than ever before, is quite generally held by physicians throughout the Territory.

From Appendix C it appears that the amount of detached service is an important factor. Not shown in that table, but gleaned from the register of patients, is the fact that the larger proportion of patients belonged to organizations lately returned from the field. In 1896 there was but little detached service, and some of that was of brief duration. The troop returning in April had been absent but three days; in May the same troop was out for seven days. Three companies of infantry were at the camp of instruction on Cobb Creek during October. The site of this camp was well chosen and the water excellent. It is remarkable, however, that the cavalry squadron, encamped near old Fort Gibson for two months, only furnished cases 5538 and 5542 to the sick report of Fort Reno. Case 5580 had intermittent fever before he went to Gibson. There were 7 or 8 cases treated there by the acting hospital steward on duty with the command. Detached service in the country to the north and east of the post resulted in the greatest amount of sickness. To the south and west, the ground is higher and drier, the population more scattered and chiefly Indian, and deep springs are oftener found. This opinion finds confirmation in the report of the Territorial board of health, received since the above paragraph was first written.

An indorsement on the sanitary report for September, 1892, states that: "Water is now furnished for drinking purposes for the whole command from Caddo Springs." It is impossible to determine what part was played by this change from shallow well to deep spring water. The well from which the drinking water for the enlisted men had been obtained was not closed lest high water in the North Canadian might prevent access to Caddo Springs. It probably continued to be used since old customs die so slowly. Malarial fevers decreased in frequency after the use of Caddo water became general, but so did detached service. The difference in rainfall must be taken into account. Very little can be learned from the sickness among those "attached to command," chiefly women and children; their environment is different. Even at Fort Brown malarial fevers were uncommon amongst them.

The diagnoses during the larger part of 1894 and 1895 are frequently incorrect. Hence the omission of this period. In 1893, 13 cases of "ephemeral fever" are recorded. These cases averaged about ten days each on sick report. I have classed them with the malarial fevers. In 1892, 8 cases of "continued malarial fever" appear. These men were sick for three to four weeks. Twenty-three cases of typhoid fever occurred this year. Was not this abortive typhoid? They are classed in my table as remittent.

It appears that there were 7 cases of typhoid in 1891. Of these, 3 were recruits, 1 of whom had been at the post for only twenty days, and 2 for a month. In 1892 there were 23 cases; 3 in July came from a troop that had returned from detached service late in the preceding month. Two more, in October, had been only three months in service and presumably, since they were in that regiment, belonged to a detachment of 41 recruits sent to the Fifth Cavalry from Jefferson Barracks. Three of four months' service, in November, probably came from the same depot. All of the other cases but one were from troops that had recently returned from detached service in the field. In 1893, 13 cases. Three troops returned from the Cherokee Strip late in September and furnished 4 cases to the October report. In 1896, 2 cases, both contracted elsewhere.

There have been none of those continued fevers, not amenable to quinin and lacking the symptom-complex of typhoid, that I have seen at Fort Klamath, at Fort Brown, and at Fort Hamilton after the return of the troops from Fishers Island. In this connection, the remarks of Dr. Hatchett, in Appendix B, are of interest.

I wish to acknowledge my obligations to Maj. Walter Reed, surgeon, for his advice and assistance in the study of the malarial organism.

TABLE A.—*Rainfall, mean maximum temperatures, and fevers.*

Month.	1891.					1892.					1893.					1896.				
	Rain.	Mean maximum.	Intermittents.	Remittents.	Typhoid.	Rain.	Mean maximum.	Intermittents.	Remittents.	Typhoid.	Rain.	Mean maximum.	Intermittents.	Remittents.	Typhoid.	Rain.	Mean maximum.	Intermittents.	Remittents.	Typhoid.
January	2.02	47	2	...	...	.66	....	1	1	...	.30	55	1-2b	...	...	.40	49	....	...	...
February	.13	55	3	...	...	1.00	....	1	....	...	7.20	53	1	...	...	.30	57	....	...	...
March	2.47	59	4	...	...	3.10	....	3	....	...	1.90	65	2	...	...	.60	61	....	...	...
April	2.10	74	5	...	...	1.12	....	4	....	...	1.92	76	7	...	...	1.05	79	3	...	...
May	3.02	76	1	1	...	7.37	....	15	-2a	1	1.88	79	.....	...	1	1.50	88	1	...	...
June	5.02	84	4	...	...	2.62	....	16	-2	1	3.25	90	6-2	1	2	1.29	93	1	...	1
July	6.97	87	14	...	...	1.80	93	5	-1	6	5.62	93	3-8	...	4	4.05	94	3	...	...
August	1,02	91	14	...	...	4.30	....	6	-2	3	10.25	86	8	3	2	3.31	98	....	...	...
September	1.17	87	13	1	4	1.93	....	9	-1	...	1.17	89	7-1	3	...	1.85	86	3	...	...
October	.30	78	36	1	1	5.21	....	7	....	8	.....	81	7	4	4	2.18	74	2	...	1
November	.85	63	19	...	1	.....	61	6	....	4	.93	67	6	2	...	1.30	57	1	...	...
December	1.70	58	8	3	1	4.40	47	....	....	...	1.46	60	.....	...	...	.30	....	1	...	...
Total	26.77	....	123	6	7	33.51	....	73	1-8	23	35.88	....	48-13	13	13	18.13	....	15	...	2

a Cases reported as continued malarial fever. *b* Cases reported as ephemeral fever.

Mean strength of command in 1891, 1892, and 1893, about 325; in 1896, about 400.

B.

EL RENO, OKLA., *December 21, 1896.*

DEAR SIR: * * * Regarding malarial fever, I will say that there have been very few cases in my practice the past two years. Prior to that time it was more prevalent in the country. The druggists of this place tell me that they have not sold one-tenth the amount of quinin and various chill tonics that they did in the years 1891, 1892, and 1893. Many intermittent cases receive domestic treatment, the physician never seeing them; only the inveterate cases, as a rule, reach his observation. The statement of the druggists corroborates the statement of the physicians throughout the country who claim that malaria has been unusually light in the past two years.

I have treated this year 10 cases of typhoid fever with 2 deaths. We expected an unusual prevalence of typhoid this season, but such was not the case. I attribute this largely to an improvement in the quality of the drinking water used. The public are much more careful now regarding the water they drink than they were two or three years ago; 75 per cent of all the cases of typhoid that I have had in the Territory can be traced to the use of bad water.

There is much diversity of opinion among the physicians of the Territory regarding the nature of our fevers. Some call everything malarial that does not approach very closely to a typical typhoid, while others regard many of the mild continued fevers as typhoid, especially when they occur in such seasons as this and the last and are accompanied by other grave typhoid cases. I am of the opinion that many fevers regarded as malarial are really typhoid, and wish that I had the time and ability to investigate them more closely.

Yours truly,

J. A. HATCHETT.

SAM. Q. ROBINSON,
Major and Surgeon, U. S. A., Fort Reno, Okla.

TABLE C.—*The relation between detached service in the field and prevalence of fevers.*

Month.	1891.			1892.			1893.			1896.		
	Returned from detached service.	Malarial.	Typhoid.	Returned from detached service.	Malarial.	Typhoid.	Returned from detached service.	Malarial.	Typhoid.	Returned from detached service.	Malarial.	Typhoid.
January	1 troop..	2	....	.....	1	....	1 company.	3	....	.....	....	....
February	.....	3	....	.....	1	....	.....	1	....	.....	....	....
March	40 men..	4	....	.....	3	....	.....	2	....	.....	....	....
April	.....	5	....	4 troops.	4	....	2 troops.	7	....	1 troop..	3	....
May	.....	2	....	.....	17	1	.....	....	1	....do	1	....
June	40 men..	4	..A	1 troop..	18	1	1 troop..	9	2	.....	1	1
July	1 troop..	14	....	.....	6	6	4 troops.	3	4	.....	3	....
August	....do	14	....	1 troop..	8	3	.....	11	2	.....	....	....
September	2 troops.	14	4	2 troops.	10	....	3 troops; 41recruits	11	....	.....	3	....
October	....do	37	1	1 troop..	7	8	.....	11	4	2 troops.	2	1
November	1 troop..	19	1	2 troops.	6	4	.....	8	....	3 companies.	1	....
December	....do	11	1	.....	....	....	.....	2	....	.....	1	....

Capt. R. S. Woodson, assistant surgeon, United States Army, in discussing the fevers of Fort McIntosh, Tex., during the year 1896, states that typhoid fever is extremely rare, no typical case of undoubted etiology having been seen since the epidemic of 1893, which was reported by Capt. W. B. Banister. (Annual Report of the Surgeon-General, June 30, 1895, p. 32.) The infection in that instance was imported from Fort Reno, Okla., by Troop C, Fifth Cavalry, the first two cases having appeared in this command within eight days after its arrival from that post. In Troop D of the same regiment, which arrived at the same time from Fort Sill, Okla., no case occurred during the first month of the outbreak. Although typhoid fever is infrequent at Fort McIntosh and in the town of Laredo, it occurs among the half-breed Mexicans who live near an arroyo in the vicinity and make use of a foul surface water. Dr. Woodson considers that too much importance has been attributed to the continuity of the febrile movement as indicative of typhoid fever, overlooking the disturbing effects of complications from errors of diet, environment, etc. On the other hand periodicity is not peculiar to malarial fevers, being observed frequently in pyogenic infections. While not denying the possibility of a mixed infection, he considers that the occurrence of an initial periodicity should not without microscopical confirmation be accepted as evidence of a malarial complication any more than the high oscillations observed at the close of typical cases should be regarded as a malarial termination. The low fevers of Fort McIntosh are regarded by him as adynamic malarial fevers. His report states that:

The natural environmental conditions of this section as regards soil, soil moisture, and vegetation, together with natural drainage and low humidity, are adverse to the evolution of the malarial organism. The soil, though stiff and impervious from admixture of clay, with great depth of soil moisture and scant vegetation, is not devoid of organic matter, the energy of whose fermentation under the influence of heat and moisture, not being transformed into vegetable growth, would, in the presence of the proper telluric conditions, constitute a potential factor in malarial evolution; consequently, a few manifestations of this affection occur during the months of greatest precipitation, August, September, and October, and wherever the natural conditions of the soil are disturbed by irrigation, etc. This is notably true of the North Laredo irrigation farm, where malarial fevers are of frequent occurrence. Further, upon inspecting the post for the cause of a slight endemic in the fall of 1895 it was found that some police party had cut down the luxuriant vegetation surrounding the open drain in rear of barracks, leaving it to decay in situ, thus instantly arresting the transformation of energy from the fermentation of the soil to the

growth of vegetation, and adding to these favorable conditions its own vegetable decadence, the prompt removal of which prevented the occurrence of any further cases.

The cases occurring in this endemic were diagnosed at the time, "malarial fever, intermittent quotidian," but from a more careful study of the disease as it exists here, and from a more intimate knowledge of the malarial parasite, they are now believed to have been cases of æstivo-autumnal type in which the paroxysms were less than twenty-four hours, giving a short period of apyrexia, to the existence of which too much importance was attached at that time.

From a somewhat careful observation of the fevers occurring at this post during the past two years I have been able to distinguish only two types of the affection, the tertian and the æstivo-autumnal. The former was observed but once, and is believed to have been of adventitious occurrence, the patient being a recruit recently arrived from a malarial section.

The æstivo-autumnal was observed more frequently, and is believed to be the endemic type peculiar to this region—a fever characterized by the absence of recurring chills, its continued and irregular form, its resistance to quinin, and the presence in the blood of its peculiar organism. The paucity of other types than this prevents a comparison of their respective plasmodia.

Two cases illustrative of the two types are presented:

(1) Private E. C., Troop C, Fifth Cavalry, a recruit, recently arrived from Southern Illinois, admitted to hospital August 8, 1896, with severe chill, lasting thirty minutes, followed by a temperature of 105° F., profuse sweat, and period of apyrexia. Plasmodia malariæ present in the blood. Three typical tertian paroxysms occurred with classical chill, fever and sweat, temperature reaching 106.2° F. Quinin administered with instant effect.

(2) Æstivo-autumnal. Private W. B. C., Troop C, Fifth Cavalry, was admitted to hospital August 10, 1896, with a fever registering 103.4° F., and pursuing a continued course, with a history of initial chill two days previous. Examination of blood revealed presence of plasmodia in different stages of development. Disease treated expectantly for first week for purpose of study. From the continued elevation of temperature, with slight morning remissions, the disease assumed an adynamic form, without, however, the muttering delirium, subsultus tendinum, etc., characteristic of the so-called typhoid condition. Quinin was administered on August 17 as a therapeutic test, with no effect other than to favor an attempt at defervescence on the following day, as evidenced by a decline of temperature. Examination of blood on the 18th revealed the presence of a few crescents and pigmented leucocytes, but no extra-corpuscular or hyaline forms were observed. Quinin discontinued. From August 19 to 24 a gradual rise in temperature was noticed, due to a severe complicating acute cystitis, with the presence of numerous bacteria in the urine. Complication cured by irrigation with solution of silver nitrate, 1 to 2,000. Examination of blood August 24 revealed plasmodia in different stages of development, but attention was principally directed to the broken-down crenated condition of the red blood corpuscles. Arsenic was here substituted for quinin, with a view of improving this condition, with the result of a gradual defervescence of fever, by lysis, and a steady improvement of subjective symptoms.

As this case is presented as a study of the endemic type of malarial manifestations of this region, the results of a carefully conducted series of blood examinations are given in detail. The blood was taken from the lobe of the ear, with aseptic precautions, on a clean cover glass, transferred to a slide and examined immediately. The microscopical accessories used were a 1-12 oil immersion objective, 1-2 ocular, Abbe condenser, tube length 160 mm. With a laboratory temperature averaging 100° F., I was enabled to observe the specimens satisfactorily for several hours after collection. Examination August 12, third day of fever, temperature 103.4°; a few hyaline, amoeboid intra-corpuscular forms, some with pigment granules and pigmented leucocytes. August 16, hyaline and pigmented intra-corpuscular forms; numerous extra-corpuscular, actively motile, round bodies, ¼ size of red corpuscle, with pigmented central clumps and clear peripheral zones; one flagellated body; several large pigmented leucocytes; numerous shrunken crenated red blood corpuscles. While examining this specimen my attention was directed to what appeared to be an elongated, oval, red blood corpuscle, in which was observed a round motile body, seemingly attempting to escape from its host. It finally emerged from the periphery of the corpuscle, but was observed to be still attached thereto by a flagellum, and struggling to free itself; finally succeeding, it sailed rapidly from the field. This was thought to be a case of preflagellation, occurring in an ovoid body. In another field of the same specimen I was enabled to observe a beautiful case of phagocytosis. In a clear space surrounded by rouleaux of red blood corpuscles a flagellated body was seen, in active motion. While observing, a large pigmented, irregularly shaped leucocyte crept upon the field. For more than an hour I watched this phagocyte in its efforts to capture the parasite. It succeeded finally in cornering the body, and was seen to incorporate the parasite within itself. August 17,

after cinchonization plasmodia greatly diminished; no extra-corpuscular forms. August 21, acute cystitis developed as a complication. Examination of urine—reaction, alkaline, sp. gr. 1030, revealed bladder cells, leucocytes, numerous actively motile bacteria of decomposition, plasmodia malariæ in the form of extra-corpuscular round bodies, similar to those observed in the blood. August 24, very few plasmodia; numerous shriveled up, crenated red blood corpuscles. August 31, no plasmodia; the red blood corpuscles much improved.

The symptoms of this case were those characteristic of the febrile state generally; their enumeration is, therefore, considered unworthy of remark, except to note the entire absence of those peculiar to typhoid fever.

In those cases in which the duration of the paroxysm was less than twenty-four hours, and where there occurred a period of apyrexia, they resembled, clinically, the double tertian (quotidian) intermittent. Where the duration exceeded twenty-four hours, the thermic movement became more or less continuous, and an adynamic condition supervened which, without the aid of miscroscopical differentiation, might easily have led to a mistaken diagnosis.

Such cases have no doubt been called atypical forms of typhoid fever, even in the absence of all symptoms of that disease except those common to all febrile states.

Besides typhoid and malarial fevers there is, however, according to some observers, a third class of fevers in the neighborhood of Fort McIntosh, comprising the cases that have been described as Texas fever, Rio Grande fever, etc., concerning the causation of which Dr. Woodson submits the following special report:

The differentiation of the fevers of the South has not kept pace with modern medical progress. The diagnostic drag nets, typhoid fever and malaria, have so monopolized the nomenclature of disease that the suggestion of a third fever is received with incredulity on the part of the profession. Many continued forms of disease of doubtful etiology have been reported as typhoid fever. Some local practitioners have disregarded differentiation and have adopted such terms as slow fever, Rio Grande fever, Texas fever, etc. Such looseness of diagnosis can not be but a bar to the progress of medicine.

It is conceded that the variability of the personal thermic coefficient, the different powers of resistance against the ravages of disease, and the difference of intensity and virulence of bacterial infection will modify the classical course of any fever.

That saprophytic micro organisms may under certain conditions develop into pathogenic bacteria, capable of inducing infectious disease, the type of which, being dependent upon the environment of the germ, the stage of its evolution, and the extent of infection, may also be accepted.

The conversion in the intestinal tract of the colon bacillus into the typhoid bacillus, which it so nearly resembles, and from which it is with such difficulty differentiated, and its absorption through infection atria, may be regarded as a possibility. Indeed, it has been advocated that the colon bacillus itself may become the specific causative agent in the production of disease, and certainly no one will deny that the absorption of the various ptomaines, developed in the intestinal tract from its decomposing contents, may be productive of continued fever.

While thus granting that mild atypical and abortive types of disease may occur, the conviction has been forced upon the writer that there exists a third fever of the South, not due to a specific infection or to a hidden latent lesion; and though variously denominated by different observers, yet, from their consensus of opinion as to its symptomatology, I am led to believe that I am discussing the Texas fever (not the Southern cattle fever) of Assistant Surgeon McCulloch, the intestinal toxæmia of Surgeon Davis, and the atypical typhoid of Surgeon Maus.

Two cases illustrative of the types of the disease are presented:

(1) Trumpeter Barton, Troop C, Fifth Cavalry, a man of great muscular development, gouty diathesis, exercised violently while playing the opening game of baseball Sunday, April 12, 1896, from 1 to 4 p. m.; weather intensely hot. Was much exhausted after the game. On the following day he suffered from general muscular soreness and fever. Was admitted to hospital April 15. Temperature, 103° F.; general myalgia; headache; skin dry; constipation; partial suppression of urine, 420 c. c. in twenty-four hours, color reddish-brown, strongly acid, sp. gr. 1.030, loaded with uric acid, calcium oxalate, and phosphatic deposits; pulse slow and strong. The disease dragged on with irregular thermic movement for two months, during the course of which the subjective sensations of the patient were excellent; no emaciation occurred beyond what a light diet and confinement to bed would naturally produce. Urine continued scanty, only 450 c. c. excreted as late as May 12.

(2) Blacksmith Graeff, Troop C, Fifth Cavalry, a man of powerful physique and likewise of gouty diathesis, played baseball Sunday, April 26, 1896, for the first time in four years; weather intensely hot; was much exhausted after game. He was admitted to hospital April 29. Temperature 104° F.; general myalgia; skin dry;

bowels constipated; pulse slow and tense; headache; partial suppression of urine, 600 c. c. in twenty-four hours, sp. gr. 1.028, loaded with calcium oxalate and phosphates. Temperature steadily declined under treatment, with improvement of subjective symptoms, until discharged May 9.

Numerous blood examinations were made in these cases with negative results. The quantitative estimation of urea was made but once, upon admission, in each case and was found to be normal.

The treatment consisted of alkaline diuretics, baths, and diaphoretics. Case 2 responded quickly to treatment, urinary secretion normal on the eighth day, while case 1 remained obstinate to all treatment, urinary secretion remaining below 450 c. c., with dry skin and torpid bowels for four weeks, with a continuous abnormal excretion of uric acid.

The symtomatology and previous history of the two cases were identical, but although they differed greatly in their clinical course, they are believed to have been different types of the same affection.

That a uric-acidæmia existed in both cases is reasoned, *a priori*, from their gouty diathesis, large consumption of meat and beer, with a consequent retention and deposition of uric acid in the tissues during the cold months of comparative sedentation, and its fulmination into the blood during excessive exercise upon the advent of intensely hot weather; *a posteriori*, from the partial suppression of urine, increased excretion of uric acid, slow, high-tension pulse, headache, and diminished metabolism occurring during the disease.

In addition to the fever in question, the following relevant facts were observed: (1) That children in this region (southwest Texas) are to a great extent exempt from this disease; (2) that officers and women suffer from lithæmia and neurasthenia; (3) That robust unacclimated cavalrymen were the principal sufferers from fever.

In searching for an explanation of these observations, my attention was directed to an article by Prof. John B. Elliott, in the New Orleans Medical and Surgical Journal, 1878, entitled, "Combustion and assimilation,"[1] and to Alexander Haig's Monograph, "Uric acid as a factor in the causation of disease." While the following is my own exposition of these subjects, and especially their application to the above phenomena, yet the credit of originality is due these authorities.

That the disease is not typhoid fever, I can do no better than to refer the reader to Assistant Surgeon McCulloch's able article contained in the Surgeon-General's report, 1894. That it is not malarial has been proven by the invariable absence from the blood of plasmodia. From its nonspecificity and absence of any pathological lesion, I am convinced that it is a pure neurosis, a fever of exhaustion, involving the thermogenetic, thermotaxic, and thermolytic portions of the sympathetic nervous system, and that it can be explained upon a purely physiological basis, as follows:

The manner of production of animal heat, its maintenance, distribution, control, and dissipation, and its potentiality as forming the physical basis to the phenomena of life, are questions of importance in this discussion—of especial importance is the nervous system in controlling this production, distribution, and dissipation. Those portions of the nervous system engaged in this functioning are vaso-motor and trophic; the first having to do with the distribution and dissipation of heat, the second with its production.

The process of heat production is known to be an oxidation, in which, under the domination of the trophic nervous system, the potential energy stored up in the protoplasm of the cell during tissue anabolism is converted into kinetic heat and mechanical work plus the product of katabolism, as evidenced by the appearance of carbon dioxid and water in the pulmonic exhalations, and urea, uric acid, etc., in the renal excretion. But the maintenance of the nitrogenous equilibrium in this fever, as evidenced by the lack of emaciation and normal excretion of urea, would indicate the small rôle played by morphotic combustion in its production, and while not denying the causative agency of this form of combustion in the production of the pyrexia of other diseases, yet, in my opinion, it has but a limited place in the etiology of this affection.

Constructive metabolism is not believed by physiologists to be attended by the evolution of heat, but the nutritive pabulum, which is not lifted up into the protoplasmic molecule, the luxus consumption of the ancients, also undergoes oxidation, and contributes largely to the maintenance of normal bodily temperature, and principally to the production of this fever.

It is evident that the bodily heat produced by the combustion of floating proteids

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[1] The essence of this excellent and most convincing article is that the energy liberated during katabolic combustion is utilized in lifting the food pabulum into the protoplasmic molecule. That any arrest in this process by reason of trophic inhibition, from whatever cause, is accompanied by the evolution of a lower grade of energy, in the form of heat. He, therefore, briefly defines fever as an increased heat production, resulting from deficient tissue formation.—R. S. W.

must vary inversely with constructive metabolism. The evidence of this is the elevation of temperature observed after a full meal, where there exists a "luxus consumption" to be oxidized, and the subnormal temperature observed during starvation, although tissue combustion is increased in the attempt to supply the requisite heat.

Under normal conditions of diet, exercise, and health, the normal ratio between these two processes obtains under the specific agency of the trophic nervous system; and with the aid of the vaso-motor nervous system in distributing and dissipating heat, the thermic balance between heat production and dissipation is maintained at 98.5° F.

Now, any inhibition of function of the vaso-motor and trophic nervous systems, arresting anabolism and diminishing heat dissipation, whether it be produced by surgical shock (surgical fever), in hysteria (hysterical fever), the passing of a sound (urethral fever), the irritation of bacteria or their toxins (specific fevers), or exhaustion and fulminant uric-acidæmia, by which the transformation of energy falls short in the work of anabolism, a lower grade of energy is produced, in the form of animal heat. This heat, generated at such times and expended by the elevation of body temperature, is the mechanical equivalent of the arrested energy of anabolism.

The potentiality of the nutritive pabulum itself is of importance, the inhabitants of cold climates requiring food of higher potential energy than those of the tropics. According to physiologists 1 gram of fat =9,000 gram-calories; 1 gram of carbohydrates =4,000 gram-calories. Given a constant nutritive pabulum, with a variable thermal environment, an increased demand for animal heat will necessitate diminished tissue building; a less demand, an increase, or else an overproduction of heat to be eliminated. Therefore, if an Eskimo subsists on a vegetable diet, the entire potential energy of his nutritive pabulum would be transformed into kinetic heat, to meet the requirements of his environment, at the expense of tissue building. If an inhabitant of the Tropics subsist upon fat, the high potentiality not being latent in the formation of tissue (except in the case of growing children, and this explains their relative immunity against tropical environments), there would occur an overproduction of animal heat.

As this theory of heat production is applicable to all fevers, it may be asked, what are the factors productive of this trophic inhibition. Beyond the physical exhaustion incident to excessive work or exercise involving exposure to the intense heat of a semitropical climate, there are produced, during muscular metabolism, large quantities of crystalline nitrogenous bodies leucomaines (uric acid group). In addition to this production there is among carnivorous animals a continuous introduction of these waste products contained in their food. The soldier's ration is rich in nitrogenous elements, far in excess of his requirements in a semitropical climate. The daily consumption of 20 ounces of butcher's meat, with its proportion of uric acid and allied leucomaines, products of its own antemortem metabolism, must introduce a large quantity of these waste products into the system.

These bodies are soluble in the blood in direct ratio to its alkalinity, and are excreted in the urine. Any diminution of alkalinity must result in a deposition and consequent accumulation of uric acid, etc. in the tissues. The alkalinity of the blood is lowered during the cold months by reason of comparative sedentation, absence of sweating, increased consumption of nitrogenous food, combined with (at this post) excessive beer drinking. It is increased during warm months, in spite of nitrogenous and vinous ingesta, by excessive exercise, and especially through the agency of the sweat glands in dissipating the acids of the blood.

"Ninety per cent of the heat elaborated in the human economy is eliminated through the skin by radiation, conduction, and evaporation." In this climate, during three-fourths of the year, radiation and conduction are nil, so that all of the 90 per cent of heat is eliminated by evaporation of sweat with consequent increase of blood alkalinity. Now, any sudden excessive exercise, in a gouty subject, upon the advent of intensely hot weather, will result in a fulminating uric-acidæmia, with a consequent shock to the vaso-motor and trophic nervous systems, together with the symptoms, high blood pressure, diminished metabolism, retention of waste products in muscular system, headache, partial suppression of urine, urine of high color and specific gravity.

It is to the fulmination of the intense uric-acidæmia that the paresis of the nervous system is due, with resultant continued fever. Children are exempt, to a large extent, from this fever by reason of the fact that all of their nitrogenous ingesta is utilized in the upbuilding of tissue. Officers and women, by reason of their comparative sedentation, and consequent exemption from this fulmination of the uric-acidæmia, do not suffer from inhibition of function of the vaso-motor and trophic nervous systems (fever), but do suffer to a marked extent from lithæmia and neurasthenia.

I would define the affection as follows: A simple continued fever occurring in a gouty subject, primarily dependent upon a partial inhibition of function of the vaso-motor and trophic nervous systems as a result of fulminating uric-acidæmia and physical exhaustion, consequent upon excessive and unaccustomed work or exercise, involving exposure to the intense heat of tropical or semitropical climates.

The limits of this article prevent an exhaustive discussion of all the facts and individual cases that might be advanced in support of my conception of the etiology of this affection. This paper is presented more as a suggestion than as a dogmatism, and while it represents my own personal convictions, yet a further study of the subject, with more elaborate methods of investigation, would be necessary before they can be accepted.

With regard to nomenclature, the writer has suggested the term Febris autointoxica for the reasons above indicated, but from its possible confusion with intestinal autotoxis it was withdrawn. Continued thermic fever, while a step forward, does not meet every requirement.

At the present time, and in view of our uncertain ideas as regards its etiology, it is believed that "simple continued fever" expresses the condition as nearly as any.

At the time of these observations Widal's method of diagnosis had not been presented.

The writer takes this opportunity of expressing, from his own limited investigations his convictions of its efficacy, and with the aid of which he hopes to be able to make a further study of so interesting a subject.

DIARRHEAL DISEASES.

The admission rate for diarrheal diseases was 80.02, as compared with 85.14 during the previous year, and with 121.64 the annual average of the preceding decade. The colored troops participated in this progressive relief from diarrheal attacks to a greater extent than the white troops, their rate for the past year having been only 48.93. The nonefficient rate of the Army was 0.74 per thousand. Three of the military departments had the rates above the army mean; the Department of Texas, 125.22; the Department of the East, 103.38, and the Department of the Colorado 91.80.

The posts giving the highest rates of admission were Fort Clark Tex., 301.89 per thousand of strength; Fort Monroe, Va., 227.87, and St. Francis Barracks, Fla., 217.95. The nonefficiency was greatest at the last-mentioned post, 2.93 per thousand. The average number of days each case was treated was 3.3, but this was greatly exceeded at a few posts, as Jefferson Barracks, Mo., where the time was 9.52 days; Fort Barrancas, Fla., 7.14, and Fort Grant, Ariz., 6.50 days. Fifty-four cases of acute dysentery with no death, and three of chronic dysentery with one discharge for disability are included in the diarrheal cases. The average number of days' treatment for the cases of acute dysentery was 7.2, for those of chronic dysentery 52.7.

VENEREAL DISEASES.

The admission rate for all venereal diseases during the year was 78.08 per thousand of strength and the nonefficiency 5.26. The absolute number of cases was 1,961, of which 1,265 were gonorrheas, 96 gonorrheal epididymitis and orchitis, 324 chancroids and their results, and 276 syphilis. The average number of days' treatment for the gonorrheal cases was 21.96, for the syphilitic cases, 40.27. One death from syphilis was reported.

The admission rate for these diseases has risen somewhat during the past year. The rate for the year 1895 was 73.72, and the mean annual rate for the previous decade 76.92, with a nonefficiency of 5.24. As the rates have been practically stationary for more than a dozen years, we may infer that the minimum prevalence of these diseases under existing military conditions has been reached. The slight increase during the past year affected the white troops only. The rates among the colored men fell from an average annual rate of 80.64 admissions for the decade to 56.53 for the year, and from an average nonefficiency of 5.4 to 3.18.

Only two of the departments had rates in excess of the army average—the Department of the Missouri, with 115.87 admissions per thousand of strength, and the Department of Texas, with 98.55. Omitting small posts from consideration, the posts which had the largest rate of admissions were Jefferson Barracks, Mo., 211.59; Fort Ringgold, Tex., 206.35; Fort Leavenworth, Kans., 184.70; Columbus Barracks, Ohio, 160.26; Fort Thomas, Ky., 155.28, and Fort McIntosh, Tex., 151.26. This last post, although exceeded by so many others in the relative number of cases, had the largest nonefficient rate, 22.36 per thousand of strength, the average duration of each of its cases being 54.11 days. Jefferson Barracks had a nonefficiency of 14.53, the average duration of each case being 25.14 days.

ALCOHOLISM.

The admission rate for alcoholism was 29.06 for the Army as a whole—31.20 among the white and 5.70 among the colored troops. Seven deaths among the whites were due directly to this cause. This is a slight improvement on the record of 1895, which showed 30.11 as the rate for the Army, with 32.16 and 6.47 for the white and colored, respectively, and a very considerable improvement on the record of the preceding decade, which gives 41.04 as the average annual rate for the Army—4.62 for the colored and 45.07 for the white troops. During the past year the Department of the Platte had the largest rate, 40.63, with 1 death. The departments of the East and of the Columbia had rates above the army average, and the former had 1 death. The other departments had rates below the average, the lowest being in the Department of Dakota, 17.61; but the Department of the Missouri had 3 deaths and the Department of Texas 2 deaths. Only two posts had the admissions in excess of 10 per cent of the command—Fort Warren, Mass., and Camp Eagle Pass, Tex. In 1895 five posts exceeded this percentage. Several posts had no entry for alcoholism during the year. Among them were Fort Robinson, Nebr.; Fort Ringgold, Tex.; Fort Harrison, Mont.; Fort Du Chesne, Utah, and many of the arsenals. (See Table XVI, p. 205.)

RHEUMATIC AFFECTIONS.

These include the affections reported under the headings rheumatic fever, muscular rheumatism and myalgia, and arthritis, chronic rheumatic. During the year there were 102 cases of acute rheumatic fever, with 1 discharge for disability, and 1,397 cases, with 27 discharges and 1 death, reported under the other two headings. The average duration of the febrile cases was 37.8 days. The absolute number admitted for rheumatic affections gives a rate for the year of 59.68 per thousand of strength; the rate for the colored troops being 71.26 and for the white troops 58.61. The army rate of 1895 was 64.08 and the average annual rate of the preceding decade 79.33, so that the rate of the past year compares favorably in this respect with former records. The departments of the East, of the Missouri, of Dakota, and of Texas had rates which differed but little from the mean rate of the Army for the year. The departments of the Platte and of the Colorado had higher rates; those of the Columbia and California lower rates. The rates of the latter were 50.31 and 34.44, respectively.

Of the larger posts, the post having the greatest prevalence was Fort Huachuca, Ariz., where the admissions equaled 205.53 per thousand of strength and the nonefficiency 4.08. All the other posts had less than 150 admissions per thousand of the command. Fort Niagara, N. Y.,

had the largest nonefficient rate, 8.47, each case being 25.96 days under treatment. The cases at Fort Brown, Tex., were of a more protracted character, having been each under treatment for 33.88 days, although the nonefficient rate was only 6.67.

TUBERCULOSIS OF THE LUNGS.

In the Army during the year there were 40 cases of tuberculosis of the lungs, resulting in 34 discharges for disability and 6 deaths. These gave an admission rate of 1.59. Among the white troops this rate was 1.52; among the colored troops 2.38, while the respective discharge rates were 1.08 and 3.17, and the death rates 0.20 and 0.45. This is an improvement on the previous year, when the admission rate was 2.42, and on the annual average of the previous ten years, when it was 3.24. The rates in the departments of Dakota, the Colorado, and the Platte were similar to that of the Army; those in Texas and the East were higher; in the Missouri, the Columbia, and California lower. The lowest rate 0.93 was recorded in the Department of the Missouri. The largest absolute number of cases, 4, was reported from Fort Sam Houston, Tex., giving an admission rate of 6.19 per thousand, but the largest admission rate, 7.92, was the result of 3 cases taken on sick report at Fort Robinson, Nebr.

PNEUMONIA AND PLEURISY.

Fifty cases of croupous pneumonia, 7 fatal, were admitted to sick report during the year, the average duration of each case being 29.1 days. Sixteen cases of catarrhal pneumonia, 2 fatal, were also recorded; their average duration 45.1 days. The admission rate calculated on these cases was 2.63 per thousand of strength, an improvement on 2.98 of the previous year, and particularly on 4.28 of the previous decade.

Thirty-seven cases of pleurisy, 2 of which resulted in discharge for disability, were recorded during the year. This also was a great improvement on the previous year, when 71 cases with 2 deaths and 2 discharges were reported.

INJURIES.

The admissions for injuries during the year were equivalent to 279.75 per thousand of strength, with 8.73 constantly disabled, 1.62 deaths, and 2.02 discharges on account of permanent disability. These differed but little from the rates of the previous year: Admission, 272.69; nonefficient, 8.46; death, 1.61; discharge, 2.34; and although when compared with the average annual record of the preceding decade the admissions are relatively more numerous the cases were evidently not so grave. The average annual rates for the decade were: Admission, 250.95; nonefficient, 8.63; death, 2.41; discharge, 3.51. The post which had the largest admission rate, 623.24, was Fort Myer, Va., but this post had a constant disability of only 14.36, with 1 death and no discharge, while at Fort Riley, Kans., where the admission rate was 601.69, there were 4 deaths, 2 discharges, with a constant disability of 18.42 per thousand of strength. Both of these are cavalry posts.

A little more than one-half of the injuries consisted of contusions and sprains, giving a constant disability of 3.32 per thousand men. Ninety dislocations were reported, and 193 fractures not gunshot; 7 of the latter were fatal and 8 were discharged for permanent disability. Fifty-three cases of gunshot wounds were reported, 14 of which died and 10 were discharged on surgeons' certificates. There were 93 cases of

exhaustion from fatigue or exposure, 23 of sunstroke, and 47 of frost-bite; none of these were fatal. Seventy-six hernial cases occurred during the year, 16 of which were discharged for disability.

The total number of deaths from injury was 44, 6 of which occurred among colored troops; of discharges 55, 3 among colored troops. The 44 deaths included 4 homicides and 5 suicides. Nine cases of drowning were reported during the year.

Suicides.—Only 12 cases of suicide were reported, as compared with 19 during the previous year. The largest number at any one post was 2 at Fort Leavenworth, Kans., and 2 at Fort Douglas, Utah. Four occurred in the month of September, 2 in May, and 1 in each of the months of January, February, April, June, August, and October. Five of the deaths resulted from gunshot injuries and 7 from poison (morphine 4, cyanid of potassium 1, corrosive sublimate 1, and "Rough on Rats" 1). In 5 cases the cause was reported as unknown, 2 dependency, 1 financial embarrassment, 1 melancholia, 1 mental depression, and 2 alcoholic excesses. Six of the suicides were enlisted men of the infantry, 2 of the cavalry, 1 of the artillery, 1 of the hospital corps, 1 of the subsistence department, and 1 officer of the infantry. Two were under 25 years of age; 4, 25 to 34 years; 2, 35 to 44 years; and 4 over 44 years. One had eight months' service, 2 four years', 2 six years', 1 eight years', 1 nine years', 3 from ten to twenty years', and 2 over twenty-five years'. Five were natives of the United States, 3 Ireland, 2 Holland, 1 Germany, and 1 England.

INFLUENCE OF AGE, ARM OF SERVICE, NATIVITY, AND LENGTH OF SERVICE ON SUSCEPTIBILITY TO DISEASE.

Table XVII, on pages 206–230 of this report, consolidates the medical statistics of the Army for the past seven years, 1890–1896, inclusive, and gives under the various headings the mean annual rates for that period. The ratios are those of admission, constant sickness, discharge, and death, for officers and enlisted men separately. They are arranged for various diseases and classes of disabling causes according (1) to corps or arm of service, (2) to age by periods of five years, (3) to nativity, and (4) to length of service. On account of the rapid change which takes place in the personnel of our Army, so far, at least, as the enlisted men are concerned, the rates in this table may be regarded as equivalent to those of an army of 174,988 enlisted men for one year. The absolute numbers from which the rates have been calculated are as yet, in many of the classes, too small to give reliable ratios. They are as follows:

Arm of service.	Officers.	Enlisted men.	Per cent.
Infantry	6,017	81,997	46.36
Cavalry	2,997	42,750	24.10
Artillery	1,975	24,151	13.76
Ordnance	402	3,474	2.04
Engineers	813	3,174	2.10
Medical	1,275	5,250	3.44
All others	1,380	14,192	8.20
Total	14,859	174,988	100
	189,847		

Age.	Officers.	Enlisted men.	Per cent.
19 years and under	.....	1,504	.79
20 to 24 years	728	50,477	26.97
25 to 29 years	2,359	54,919	30.17
30 to 34 years	2,283	29,754	16.88
35 to 39 years	2,173	15,980	9.56
40 to 44 years	1,781	10,988	6.72
45 to 49 years	1,573	7,931	5.01
50 to 54 years	2,007	2,732	2.50
55 to 59 years	1,390	597	1.05
60 years and over	565	106	.35
Total	14,859	174,988	100
	189,847		

Nativity.	Officers.	Enlisted men.	Per cent.
United States	14,134	112,212	66.55
Irish	273	19,977	10.67
German	133	19,543	10.36
English	78	6,099	3.25
Canadian	75	3,127	1.69
Scandinavian	15	3,677	1.94
Scotch	45	1,360	.74
Swiss	18	1,381	.74
Austrian	5	1,876	.99
Danish	.....	1,801	.95
French	35	568	.32
All others	48	3,367	1.80
Total	14,859	174,988	100
	189,847		

Length of service.	Officers.	Enlisted men.	Per cent.
Under 1 year	233	28,196	14.97
1 year and over	14,626	146,792	85.03
Total	14,859	174,988	100
	189,847		

The admissions for all causes of disability among officers amounted to 765.69 and among enlisted men to 1,258.90 per thousand of their respective mean strength. Among officers the rate was largest in the artillery, 980.11, and smallest among the engineers, 168.97, the latter observation being readily understood when it is remembered how large a relative number of engineer officers are stationed where there is no army medical officer to make a report of their sickness. On the other hand, the enlisted men of the engineers had the largest admission rate, 1,684.92, while the rates of the enlisted men of the cavalry and the artillery, 1,464.10 and 1,457.87 respectively, were greater than the corresponding rate of the infantry, 1,154.21. The men of the hospital corps had the smallest rate, 527.04. The high rate among the engineers was due to injuries and malarial fevers, with a considerable excess of alcoholism, bronchitis, diarrhea, rheumatism, and myalgia. The disabling causes which produced the high rates in the cavalry as compared with the infantry were injuries, which gave a rate of 387.54 as compared with the infantry rate, 237.94; but the excess of admissions among the cavalrymen is not all accounted for by this, for disease caused a rate of 1,076.56 as compared with the infantry rate, 916.27. Malarial diseases were the principal causes of the excess, but diarrheas, boils and abscesses, and conjunctivitis also aided in making up the total. The high admis-

sion rate among the enlisted men of the artillery was caused in part by injuries which occasioned a rate of 294.26, but disease alone among these men gave a higher rate, 1,163.61, than the rate of admission for all causes of disability among the infantry. The diseases which occasioned this excess of sickness were, as in the cavalry, chiefly malarial infections, 163.24 per thousand of strength, with a somewhat increased rate for venereal diseases, due to the location of artillery posts in the vicinity of cities, vaccinia, diarrhea, boils and abscesses, coryza, and bronchitis.

Although the admission rate for officers was so much smaller than that for the enlisted men, their nonefficiency was considerably greater, being 44.27, as compared with 37.63. Nonefficiency was greatest among officers of the cavalry and artillery—53.90 and 52.57, respectively. Medical officers had a higher rate, 47.07, than infantry officers, 46.05. Among enlisted men nonefficiency was greatest in the cavalry, 43.92, and least in the hospital corps, 17.08. The artillery had a rate of 41.11, and the infantry 35.36. Notwithstanding the high rate of admission among the engineers, their constant sickness was only slightly above the mean, showing that the cases were relatively of short duration. The chief causes of nonefficiency among enlisted men were injuries, 8.65 per thousand of strength, venereal diseases, 5.53, and rheumatism and myalgia, 3.02.

The mean rate of discharge for disability was 16.40 per thousand of strength. This mean was slightly exceeded in the artillery, cavalry, and infantry. Injuries occasioned 3.09 of the 16.40; consumption, 1.65; venereal diseases, 1.48; heart disease, 1.24; and rheumatism and myalgia, 1.23.

The death rate among officers varied from 6.08, in the artillery, to 17.41 in the ordnance, the mean being 9.56 per thousand of all officers. Death from injury was relatively more frequent among ordnance officers than in the other corps. The death rate among the enlisted men varied from 4.73 in the engineers to 10.65, in the ordnance, the mean being 6.52, which was practically the rate of the infantry. The rate in the artillery was considerably below and in the cavalry above this mean. Deaths from injury were relatively more frequent among the men of the ordnance and the cavalry, 3.45 and 3.27, respectively, than in the other branches of the service. Of individual diseases, typhoid fever and pneumonia gave the highest death rates, 0.59 and 0.55, respectively. Consumption gave 0.51, heart disease 0.29, and the direct effects of alcoholism 0.23.

Influence of age.—The admission rate for all officers having been 765.69 per thousand of their number, it may be observed that those between 30 and 40 years of age and those over 55 years had rates smaller than the mean. The highest rate, 897.88, was given by officers under 25 years of age. Injuries were relatively of more frequent occurrence among those under 30 years. The admissions of enlisted men from 30 to 54 years of age did not exceed one for each man of the strength present, but men older than 54 and men younger than 30 had considerably higher rates. Those from 20 to 24 years gave a rate of 1,722.91 per thousand of their number. Injuries were of more frequent occurrence among these young men than among older soldiers. Typhoid fever, both among officers and men, was more prevalent among those under 30 years. The rate for this disease in men from 20 to 24 years, was 10.31; from 25 to 29 years, 5.74; from 30 to 34 years, 2.58, susceptibility diminishing as the age increased. Enlisted men under 25 years of age suffered more from malarial fevers than officers of the same age; but with the advance of years the rates of the men came to

differ little from those of the officers. The rates for venereal disease in excess of the mean were given by men under 30, and particularly by those under 25 years of age. On the other hand, the rates for alcoholic intoxication increased with age. Tuberculosis of the lungs was not specially prevalent among men of a certain age. The records show a comparatively even distribution of this disease among enlisted men from 20 to 50 years of age. The excess of diarrheal diseases was confined to soldiers under 25 years. Rheumatic fever, according to the statistics, was not specially prevalent among young men; the soldier appears to be susceptible at all ages and the susceptibility to be increased after 40 or 45 years of age. The admissions for rheumatism and myalgia also increased notably with advancing years. The rates for pneumonia became considerably larger after 45 years of age, and diseases of the kidney were much more common after this age was reached.

The nonefficiency or constant sickness of the officers of the Army was less between the ages of 35 and 39 than in any other period of five years, but after the age of 40 it increased materially. It is to be observed that officers under 25 had less sickness, 35.15 per thousand of strength, than those who were five and ten years older, in this differing remarkably from the nonefficiency rate, 50.03, that prevailed among enlisted men under 25, and indicating that if the same attention were given to sanitary conditions by the young enlisted man as by the young officer his rate of constant sickness would be correspondingly reduced. In other words, the constant sickness that prevails among young soldiers as compared with older soldiers is wholly of a preventable character.

The rate of discharge for disability between the ages of 25 and 39 was lower than the mean discharge rate of the Army.

The death rate among both officers and men may be said to have increased slightly with age up to 40 years, and very rapidly with advancing years subsequent to that age. Deaths from injuries were relatively greatest among officers from 25 to 29 years of age. Among enlisted men the mean death rate from injuries, 2.35, may be said to have been evenly distributed through the various ages. The fatalities from typhoid fever among officers under 25 years were relatively much more numerous than among enlisted men of the corresponding age, although the admission rate of the latter was the larger. The death rate of young officers from this fever was 2.75; of enlisted men, 0.95. The death rate from the direct effects of alcohol among enlisted men increased rapidly with advancing years.

Influence of nativity.—It may be observed that the rates for officers outside of those born in the United States are of no value, on account of the small number of individuals forming the total under each heading. Indeed, even the rates for the enlisted men of Scotch, Swiss, Austrian, Danish, and French birth may also, and for the same reason, be considered as valueless. Enlisted men natives of the United States and Canada had the largest sick rates: United States admission rate, 1,322.79; Canadian, 1,323.44, as compared with the mean of the Army, 1,258.90; United States rate of nonefficiency, 39.42; Canadian, 41.91, as compared with the mean, 37.63. Natives of Germany had the lowest admission rate, 1,041.87; natives of England the lowest rate of nonefficiency, 31.66. Typhoid fever and rheumatic fever had their greatest prevalence among Canadians and Scandinavians. The highest admission rates for consumption were 5.70 among the French and 4.76, among the Scotch; the lowest rates were 1.42 among the English and 1.49 among the Germans; the rate among the natives of the United States

being 3.33. Pneumonia was more frequent among Canadians, 5.18, and Scotch, 4.76, than among men of other nativities; the United States rate was 3.90. Venereal diseases prevailed more among natives of the United States and Canada than among the others, the admission rates for these two classes being 93.98 and 91.92, respectively, per thousand of their number; the Swiss and Irish had the lowest rates, 47.66 and 50.96. The Irish, however, had by far the largest relative number of cases of alcoholism, 90.96; the smallest rates were given by Danes 12.59, and Austrians, 19; the rate of the native-born United States soldier having been 28.51.

Influence of length of service.—The tables divide the men into those who have had less and those who have had more than one year's service. From them it will be observed that recruits in their first year of service are especially liable to sickness. The admission rate for these was 2,122.17, while that of the older soldiers was only 1,093.07. Their nonefficiency was 61.76, as compared with 32.99 for the men of longer service, and their sickness was of such a character as to permanently disable 24.96 per thousand of their number discharged on certificates of disability, as compared with a discharge rate of 14.76 among the others.

The vaccination of recruits necessarily brought a number of cases on sick report, a little over 200 per thousand of strength having thus been added to their admission rate. The recruits are evidently not so much given to the excessive use of alcoholic stimulants as the older soldiers, their admission rates for alcoholism having been 17.19 and 39.99, respectively. With this exception, young soldiers appear to have been more susceptible to all disabling causes than their more experienced comrades. As illustrative of this may be cited their admission rate for injuries, 414.91, as compared with 242.93 among the others; for venereal diseases, 156.52, as compared with 65.81; malarial diseases, 137.84, as compared with 70.97; and typhoid fever, 11.22, as compared with 4.68.

CIVILIANS ATTACHED TO THE ARMY.

The civilian attachés of the Army comprise the families of officers and enlisted men, servants, employees of the various departments and their families, and all persons not included in the personnel of the Army who are allowed to reside at military stations or to accompany military commands. The average number of these present during the year was: Adult males, 2,158; adult females, 5,745; children, 6,038; total, 13,941. The deaths that occurred among them are shown in the following statement:

Disease.	Adult males.	Adult females.	Children.	Total.
Infectious, general	4	11	18	33
General nutrition	1	2	8	11
Nervous system	1	1	1	3
Digestive system	1	7	10	18
Circulatory system	3	1	1	5
Respiratory system	2	5	11	18
Genito-urinary system	1	4	.....	5
Total from disease	13	31	49	93
Total from injury	2	2	3	7
Unknown	.....	2	2	4
Total from all causes	15	35	54	104

MARRIAGES AND BIRTHS.

On the reports were noted 28 marriages, 7 of officers, 18 of enlisted men, 3 of civilian attachés.

The births reported numbered 412; males, 207; females, 205. Eighty-nine were children of officers, 290 of enlisted men, 33 of civilians. Nine Indian children, 4 males and 5 females, born at Fort Sill, Okla., are included in the total.

SURGICAL WORK OUTSIDE OF MILITARY PRACTICE.

Capt. A. E. Bradley, assistant surgeon, Fort Yellowstone, Wyo., reported 2 cases of laparotomy with ventral suspension of the uterus in cases of retroversion and chronic endometritis. The results were gratifying. He describes also the details of an interesting case of hysterectomy for fibroid uterus, pyosalpinx, cystic ovary, and intraligamentous cyst. A case of ovariotomy also was reported by Capt. E. B. Frick, assistant surgeon, Presidio of San Francisco, Cal. These cases were as follows:

Dr. Bradley's first case.—Mrs. X. first came under my care in the spring of 1896. Her health seemed completely broken down, the immediate cause apparently due to a horseback ride followed in a short time by violent exercise at a hop. She is of a nervous temperament, was never strong as a girl, and was married when 21. She bore three children in quick succession, the youngest four years after marriage.

When I first examined her she was suffering very much from pelvic discomfort, back ache, etc., and it was discovered that she had a lacerated perineum, subinvolution of the uterus which was retroverted, and a chronic endometritis. For some time I temporized, using hot douches, glycerin tampons, and local applications of iodine and silver to the endometrium. When inflammation subsided somewhat, pessaries were tried, but it was found that operative procedures were necessary to hope for permanent results. In May, 1896, after careful preparation, and with the usual surgical precautions, I carefully curetted the endometrium, packing the uterine cavity and the vagina with iodoform gauze, and did a flap-splitting operation for the repair of the perineum, which had been lacerated back to within one-half inch of the anus.

She did well after the operation, and as soon as possible a suitable pessary was introduced to maintain proper position for the uterus. For several months she was in fairly comfortable condition, but I found the old condition of retroversion always existing when she was without a pessary, and many times when with one. After many tiresome months of the most painstaking treatment, I finally resolved to suspend the uterus to the abdominal wall. This I did December 6, 1896. Strict aseptic precautions were taken in all the arrangements. Having made a 3-inch incision into the peritoneal cavity the body of the uterus was grasped by two fingers and brought forward into the incision. Three silkworm gut sutures were then introduced through all the tissues on each side of the incision, and through the fundus of the uterus going about one-eighth inch in depth and picking up about one-half inch of tissue. Before securing these sutures a requisite number of silk sutures were placed to close the remainder of the incision. I scarified the uterine peritoneum included in the sutures, and closed the incision, using perforated shot for the silkworm gut.

The ovaries and tubes were normal. Boric acid was powdered on the wound and a voluminous sterilized dressing applied. Aside from a most protracted period of anæsthetic nausea, and vomiting, the patient did well. At no time was the temperature above 99°. The dressing and the silk sutures were removed on the eighth day; of the silkworm gut I removed two sutures on the fourteenth and the third on the twentieth day. I was afraid union would not be strong enough to sustain the uterus in position; for this reason I scarified and allowed the sutures to remain as long as I did. The uterus was in good position when the sutures were removed and has so remained. The patient was kept in bed for four weeks and gradually gained in health and strength. At this time, six months after operation, she is in excellent health. People who have known her for a long time say the change in her has been remarkable. From an irritable, hysterical invalid she has come to enjoy life in a healthful manner. This patient has floating kidneys. The right seems to have a long pedicle; it can easily be carried well down into the pelvis and across to the other side; the left, however, while easily recognized as freely movable, can not be

induced to take such excursions. As she is slight in build, they are easily maintained in position by small pads, held in position by a snug-fitting waist, and give her no trouble at all.

Dr. Bradley's second case.—Mrs. Y. is 35 years of age, has been married five years, and has two children; labor difficult for both; perineum said to have been torn with the first child, but repaired at the time. When first seen she had subinvolution, chronic endometritis, retroversion, lacerated cervix, and a laceration of the perineum down to the sphincter. Rectocele and cystocele existed to some extent. Her symptoms were those common to such cases.

I refused to treat her unless she would submit to operation. After some delay she consented, and I operated March 4, 1897. Preliminary treatment consisted of hot douches and glycerin tampons to deplete the tissues. With the usual precautions I first curetted the uterus, packing its cavity with iodoform gauze. I then suspended the uterus to the abdomen, and finally did a flap-splitting operation on the perineum. On careful inspection I concluded the tear in the cervix would give no trouble if the other abnormal conditions were corrected, so I left it untouched.

The technique of the suspension was somewhat different from case 1. The uterus was secured by interrupted silk sutures after Kelly's method, by turning out the peritoneum of one side, inserting the needle about one-eighth inch from the incision, picking up about one-fourth inch of the peritoneum, then about 1 inch of uterine tissue to the depth of one-eighth inch, and then a similar amount of peritoneal tissue on the other side; the sutures were then tied and cut short. Three such sutures were introduced, the peritoneum closed by a running catgut suture, and the remaining tissues with interrupted silk. In this case, too, I placed one silkworm gut suture through all the tissues and the fundus for support.

Convalescence was uninterrupted, no complication of any kind arising. The silk sutures were removed on the eighth day, and the supporting silkworm gut suture on the fourteenth day. Bichloride douches 1–4000 were given in this case twice daily after removing the gauze packing forty-eight hours after operation. The results were gratifying in every particular. The woman has regained her strength, does her own housework, including washing, and suffers no more from any of the pains, aches, and other discomforts which existed prior to operation.

Kelly does not use supporting sutures, but relies on the buried silk sutures which attach the uterus to the peritoneum to support and maintain the uterus in proper position; neither does he scarify. I must confess that I felt better knowing I had a firm, unyielding suture which allowed no dropping back until good adhesions had formed between uterus and peritoneum. The operation is not intended to fix firmly the fundus to the abdominal wall, only to produce a supporting ligament or adhesion. Examination in each of these cases shows the uterus to be mobile, and I estimate the adhesive ligament at this time to be about 1 inch in length. This demonstrates to my satisfaction that while scarification and supporting sutures may not be necessary in the hands of the leading surgeons, they do not necessarily, firmly, and immovably fix the uterus to the abdominal wall, but they do give one confidence that the operation will hold. Operation in each of these cases was done at the patient's home, a room being specially prepared in each instance.

I might also report several cases of other operations on the cervix, perineum, and endometrium done during the past year all with gratifying results, but do not desire to burden this report with details. I am prompted to make this short report to show what can be done in this class of cases to lessen the cares of a medical officer. Treatment not operative is always unsatisfactory in cases of this kind, and they hang on indefinitely. They lead lives of invalidism and are apt to be constantly calling for medical care and attention, which does them little or no good. Operation gives most satisfactory results, restores the patient to health, and permits the surgeon to discharge her cured.

It is admitted that these patients have no official recognition other than that they are entitled under the regulations to medical treatment; that being so, I consider it a duty to give them the best care in my power, and surgery only can give them any permanent relief. Operations of this nature are simple, easily performed, and, with proper precautions, devoid of danger. It seems to me to be unjust to the patient in many instances to send her to some noted specialist, involving, as it does, great expense, when as good results can be obtained at her home by the medical officer in charge.

Dr. Bradley's hysterectomy.—Ellen F., colored, aged 47, first consulted me for severe prostrating abdominal pain, in the early part of the spring of 1896. Examination disclosed a mass filling the pelvis, estimated to be somewhat larger than an infant's head. After controlling the pain, she gave a history of slow-growing fibroid, accompanied at the menstrual period by profuse, somewhat alarming, hemorrhage. Often between periods there were attacks similar to the one I first saw. The tumor was fixed in the pelvis and examination seemed to cause much distress. In view of her circumstances, her miserable condition prompted me to recommend operation, at the

same time fully explaining to her its hazard. Her general condition was most unsatisfactory. Her urine showed evidences of renal trouble and for months she had been losing flesh. Had she been a woman of leisure, operation would not have been considered, in view of her age, and the possibility of the menopause changes which could be expected not far in the future; but she was in failing health, was unable to do the work demanded of her as a servant, and had no means of subsistence except her own labor.

After delaying many months, during which she gradually became worse, she finally urged me to undertake operation after a particularly severe attack of pain and hemorrhage in December, 1896. This was followed by an acute exacerbation of the renal trouble, scanty urine with albumen and tube casts. I instituted preparatory treatment and soon had the renal function established in a fairly satisfactory way. As her surroundings were not in any way suitable, with the consent of the commanding officer, I admitted her to the hospital to the isolation room, and caused a woman to be employed to nurse and care for her. She was admitted the evening of January 2, and the operation was performed January 3, 1897, under strictly aseptic precautions. She was ordered warm baths twice daily for three days preceding operation, also copious sublimate irrigations. Her bowels were freely opened by salines, and food restricted for thirty-six hours prior to operation. She was given 30 c. c. whisky and 60 c. c. of beef broth early on the morning of operation. The abdomen was shaved early that morning, scrubbed, cleansed, and covered with a wet sublimated towel, which was not removed until she was on the operating table. Dr. A. H. Allen, of Horr, Mont., kindly administered the anæsthetic. Chloroform was first given, but was taken so badly that it became necessary to substitute ether. The hands of myself and assistants were treated with mustard, green soap, alcohol, permanganate, oxalic acid, and sublimate solutions.

Operation began at 11.30. My first procedure was an attempt to render the vagina and cervix aseptic. Green soap was freely used; the external parts scrubbed thoroughly. The vagina was mopped out vigorously with cotton on long dressing forceps, the cervix exposed by speculum, curetted as well as the contracted canal permitted, all the parts wiped dry with sterilized cotton and then freely flushed with one one-thousandth sublimate solution. (This should have been followed by sterilized water, but through oversight it was omitted.) The abdominal walls were then again scrubbed and washed with alcohol and sublimate solution. Sterilized towels and sheets covered the patient. A small incision was made through adipose tissue, 2 inches at least in thickness, and digital exploration determined the correctness of the diagnosis and the probable feasibility of carrying on the operation to a successful termination. The incision was then enlarged so that it extended from the pubes to about 1 inch above and to the left of the umbilicus. The omentum was adherent to the parietal peritoneum nearly the whole length of the incision, but was easily stripped off without hemorrhage. On exposing the tumor it was seen that the right broad ligament contained a cyst about as large as a cocoanut. The left ovary was cystic and about as large as a small orange. Both tubes were enlarged and thickened, evidently containing pus. The right tube passed over the cyst from before backwards. To facilitate manipulation the cyst was punctured and its contents allowed to escape. The fluid was clear, amber or straw color, about 1 pint in quantity and on evaporation deposited crystals which appeared to be cholesterin. After the collapse of this cyst it was found that the adhesions posteriorly and to the right were quite extensive. The parts of the broad ligament which could be reached were tied off on either side by two ligatures and the intervening tissue cut. This permitted the mass to be lifted up out of its bed. A corkscrew inserted into the tumor proved a valuable aid in manipulations. The presenting structures on either side were again ligated off, which permitted still further eventration. This was repeated until the mass remained attached only to the bladder, rectum, and vagina, the tissues around the vaginal attachment still containing the uterine vessels. The cyst walls on the right side extended far out into the broad ligament and dissected up the pelvic peritoneum, giving considerable trouble until the true nature of the conditions was determined. A cuff of the peritoneum was then dissected off the mass before and behind and stripped down to the vaginal junction. The vagina was then opened in front of the cervix with my left finger introduced as a guide, then in the rear. Thus the remaining attachments were on either side at the vaginal junction and contained the tortuous and enlarged uterine vessels. These attachments were clamped temporarily, cut, and the mass finally removed. Ligatures were thrown around these small pedicles, left long and drawn into the vagina, inverting the stumps. The vagina was sutured with running catgut, the peritoneal flaps brought together over the vaginal suture by the same material, thus leaving the pelvic floor free from any denuded tissue. The pelvic cavity was carefully sponged out, the intestines allowed to fall back into place (they had been carefully kept in the upper abdomen by the Trendelenberg position and a sterilized gauze diaphragm). The omentum was drawn down and the peritoneum closed by running catgut sutures. Silkworm gut with perforated shot was used to unite the remaining tissue, picking up occasionally the peritoneal

suture fold, so that there should be no dead space. Dressing of sterilized gauze and cotton, with an aseptic vaginal pad, was applied by a many-tail and a T bandage. In spite of the fact that the operation consumed nearly three hours the patient left the operating room in fairly good condition. There was considerable shock, but she rallied well with hypodermics of whisky and strychnin. On getting the physiological effects of the latter drug it was discontinued and nitroglycerin given instead. Anæsthetic nausea was not marked, and as soon as the stomach was quiet I began the administration of salines. It was soon evident that intestinal paralysis existed, for all medicines failed to act. I endeavored to introduce high enemata by a rectal tube, but failed to pass it beyond the rectal pouch. The catheter was used twice daily but urinary secretion was diminished markedly from the first, ceasing altogether the third day after operation. The patient became delirious and gradually failed, dying at 11 p. m. on the 7th, one hundred and eight hours after operation. The temperature was subnormal during the whole period.

Autopsy was held twelve hours after death. The abdominal incision was united throughout. The peritoneum was injected along the incision, and the omentum and intestines covered with lymph. The pelvic floor was intact, the peritoneal flaps completely united; in the pelvis was about an ounce of bloody serum mixed with lymph exudate and probably pus. The liver was somewhat contracted and injected. The kidneys were about two-thirds normal size, capsules adherent, each had several small superficial cysts, and the cortical substance of each was only about one-half the normal depth. The ureters were intact throughout. The failure to pass a rectal tube was found to be due to an acute flexure of the bowel about 6 inches from the anus, the sigmoid dipping forward down into the pelvic cavity. The heart was slightly enlarged; the valves normal; the gross appearance of the muscular tissue indicated fatty degeneration; patches of atheroma existed in the aorta. Lungs normal; universal adhesions of the pleurae on both sides.

I believe death was due immediately to failure of the renal function. There was, however, evidence of acute general peritonitis which would of itself have undoubtedly proved fatal. I am unable to state where the infection occurred, though I believe it to have been from the vagina during the final stages of the operation. Every care was taken in the preparation of dressings, instruments, assistants, and of the patient herself, but there was faulty technique somewhere. It is possible that, during the prolonged manipulation, pus may have leaked from the tubes, but they seemed intact. Examination of the mass removed shows an irregular enlargement of the uterus with varying sized nodules here and there. These are evidently fibroid masses, though desiring to preserve the specimen I have made no dissection. The left tube is enlarged, a small incision through the thickened walls showing pus; the left ovary is cystic. The right tube is much thickened and contains pus; it curves outward and backward over a cyst which seems to be developed in the right broad ligament. The right ovary can not be definitely made out, but seems to have been flattened out behind and beneath this cyst. The cervix shows that it has not been involved in the mass, but has been apparently lengthened by the upward traction of the growing mass. In my effort to avoid the important structures at the vaginal junction I kept my dissections well into the cervical tissues, thus the cervix appears more slender than it really was.

It is doubtful whether the patient could have recovered from an operation so formidable in view of the pathological renal conditions found at the autopsy. A much longer time was consumed in the operation than was desirable, but I believe I could reduce the time fully one-half if I should have occasion to repeat the operation.

Dr. Frick's ovariotomy.—On December 5, 1896, I assumed charge of the case of Mrs. Z., who is $18\frac{2}{12}$ years old, was married $2\frac{3}{12}$ years ago, and has one child now 18 months old. A lacerated cervix uteri was repaired July 15, 1896, at Fort Yates, N. Dak. For about seventeen months the patient has had pain in the region of the left ovary. This pain has grown continually worse, notwithstanding treatment by a number of physicians, until for the last three months it has been so bad as to unfit her for the ordinary duties of life. She also complains of great pain at the anus during defecation. On examination the right ovary and tube were found to be normal, but there was so much tenderness on the left side as to preclude a satisfactory examination. The patient was also found to have a small fissure at the anterior margin of the anus. It was advised that an operation for the cure of the anal fissure be done and that a more thorough examination of the left tube and ovary be made while the patient was under the anæsthetic. Accordingly on December 15 the patient was anæsthetized (chloroform being given by Acting Hospital Steward Knapp) and a careful bimanual examination was made. The left ovary was found to be firmly bound down by adhesions and it was thought the tube was slightly enlarged. The sphincter ani was then widely dilated and its superficial fibers incised through the fissure.

Ovariotomy was advised for the relief of the pain in the left side, and on the afternoon of December 26 the patient was removed to a private hospital, and on the following morning I performed the operation of ovariotomy, assisted by Drs. J. H. Barbat and F. B. Carpenter, of San Francisco. Dr. William Barbat gave the anæs-

thetic (chloroform being used). The ovary and tube were found to be adherent and congested. After carefully separating the adhesions the question arose whether this would be sufficient, or if it would be better to proceed with the operation. It was the opinion of those present that the probabilities were largely in favor of the recurrence of the adhesions with the same symptoms as before, so I proceeded with the operation. The tube and ovary having been brought up into the wound, a clamp was put on the pedicle, just firmly enough to hold but not to crush the tissues. The ovary and tube were then cut off about one-eighth inch from the clamp, the tube and individual blood vessels separately ligated with catgut, the edges of peritoneum brought together over the stump with fine catgut, and the clamp removed. The abdominal incision was then closed, the peritoneum and fascia being each united with continuous chromicized catgut sutures, and the skin with interrupted sutures of silkworm gut. The wound was dressed with sterilized gauze. After the abdominal wound was dressed the sphincter ani was again forcibly dilated, as pain during defecation (which had for a time been relieved by the first operation) had recurred. The patient made a rapid recovery without any adverse symptom. The silkworm-gut sutures were removed January 5, and on the 16th (three weeks after entering the hospital) the patient was removed to her home. She now feels well and strong and declares herself to be free from pain in the side for the most part, but on several occasions she has complained of pain not nearly so severe nor of the same character as before the operation. There is still slight pain during defecation, and the fissure has not entirely cicatrized. Since January 8 an ointment containing thiol 1.5, ung. belladonnæ 4, and petrolatum 7.5 has been kept applied to the anal region.

List of special reports received from medical officers from July 1, 1896, to June 30, 1897.

MEDICAL REPORTS.

Name.	Rank.	Report.
Adair, G. W	Major and surgeon	Measles.
Appel, A. H	Captain and assistant surgeon.	Serum diagnosis of typhoid fever.
Arthur, Wm. H	do	Practice march through Virginia. Typhoid fever, death, thermograph.
Birmingham, H. P	do	Typhoid fever with thermograph.
Bratton, T. S	First lieutenant and assistant surgeon.	Scarlet fever at Fort Niobrara, Nebr.
Cleary, P. J. A	Major and surgeon	Fevers at Fort Brown, Tex., with thermographs.
Ewing, C. B	Captain and assistant surgeon.	Malarial diseases, camp at Arcadia, Mo.
Fauntleroy, P. C	First lieutenant and assistant surgeon.	Acute glomerulo-nephritis.
Flagg, C. E. B	do	Secondary syphilis. Case of labor, face presentation.
Forwood, W. H	Lieutenant-colonel and deputy surgeon-general.	Gastro-intestinal indigestion.
Girard, J. B	Major and surgeon	Malarial and typhoid fevers at Jefferson Barracks, Mo., with thermographs.
Glennan, J. D	Captain and assistant surgeon.	Suppression of urine, blood poisoning, death.
Gorgas, W. C	do	Typhoid fever.
Harvey, P. F	Major and surgeon	Inflammation of the brain, typhoid fever, death, autopsy.
Heizmann, C. L	do	Scarlet fever and measles at Fort Adams, R. I., February to May, 1897.
Hoff, J. Van R	do	Inspection of medical department, Pennsylvania National Guard.
Howard, D. C	First lieutenant and assistant surgeon.	Mild diphtheria at Fort Custer, Mont., 18 cases.
Kilbourne, H. S	Major and surgeon	Fevers at Fort Clark, Tex.
Munday, Benjamin	Captain and assistant surgeon.	Twin parturition, malignant disease of abdominal organs.
Munson, E. L	First lieutenant and assistant surgeon.	Crebral and cerebro-spinal meningitis. A series of papers on the various phases of diabetes mellitus.
Newgarden, G. J	do	Diphtheria at Fort Yates, 3 cases.
Phillips, J. L	Captain and assistant surgeon.	Typhoid fever with thermograph.
Porter, A. S	First lieutenant and assistant surgeon.	Pleuro-pneumonia, death.
Powell, J. L	Captain and assistant surgeon.	Tertian malarial fever with thermograph.
Reed, Walter	Major and surgeon	Typhoid fever, blood tests after the method of Wyatt Johnston.
Reynolds, E. P	First lieutenant and assistant surgeon.	Fever cases at Camp Eagle Pass, Tex., with thermographs.
Richard, Charles	Captain and assistant surgeon.	Typhoid fever at Fort Brady, Mich.

List of special reports received, etc., from July 1, 1896, to June 30, 1897—Continued.

MEDICAL REPORTS—Continued.

Name.	Rank.	Report.
Robinson, S. Q	Major and surgeon	Fevers at Fort Reno, Okla.
Shannon, W. C	do	Carcinoma of the rectum.
Shillock, Paul	Captain and assistant surgeon.	Varioloid at Madison Barracks, N. Y.
Smith, A. M	do	Fevers at Fort Reno, Okla.
Stone, J. H	First lieutenant and assistant surgeon.	Diphtheria at Fort Leavenworth, Kans., 2 cases.
Taylor, B. D	Major and surgeon	Insanity.
Tesson, L. S	do	Catarrhal pneumonia, death, autopsy.
Torney, G. H	do	Physical condition of cadets.
White, R. H	do	Typhoid fever, thermograph.
Winne, C. K	do	Double pneumonia, clinical chart.
Wood, M. W	do	Continued fever.
Woodson, R. S	First lieutenant and assistant surgeon.	Disseminated syphilitic spinal sclerosis. A contribution to the pathology of inflammation. Fevers at Fort McIntosh, Tex.

Lieut. E. L. Munson, assistant surgeon, Fort Assinniboine, Mont., forwarded an admirable series of papers on the various phases of diabetes mellitus. These papers were published in full in the Journal of the American Medical Association, Volume XXVIII, Nos. 17–21 and 23. They suggest the advisability of a change in the general practice of withdrawing carbohydrates from the diet of the diabetic patient. In his first paper he discusses the occurrence of sugar in the urine, distinguishing between the increase which takes place under certain known abnormal conditions and that which is characteristic of diabetes mellitus. In the former, including febrile, traumatic, toxic, and dietetic glycosuria with that consequent on nervous excitement or depression and the glycosuria of lactation, the sugar disappears on the removal of the temporary etiologic factor; but as pathologic inquiry in the latter has failed to furnish any anatomic basis for the occurrence of the disease, it must be considered purely as a neurosis. The second paper discusses at length the chemistry of diabetic urine. An abnormal decomposition of albumin takes place, with the production among other substances of oxybutyric acid, which afterwards becomes oxidized into diacetic acid and subsequently into acetone. When the production of the fatty acids exceeds certain limits the reduction to acetone can not be completed, and the urine then contains diacetic acid or even oxybutyric acid. Diacetic acid gives the diazo-reaction of Erlich and a Bordeaux red color with ferric chlorid, while acetone responds to neither of these tests. For the detection of the latter Gunning's modification of Lieben's method was used, in which iodoform is produced on the addition of tincture of iodin and ammonic hydrate to a distillate from the fresh urine. The third paper gives the clinical history of Dr. Munson's case, and discusses the influence of diet on the abnormal constituents of the urine and the general condition of the affected individual.

The patient was 33 years of age and of excellent previous health. There was no history of any neurosis, but it was stated that his mother had been a sufferer from neuralgia, and had been subject to attacks of great mental depression. His life had chiefly been spent in open-air work. About the beginning of March he first noticed a polyuria and white spots left by evaporated drops of urine. He then weighed 148 pounds. Loss of weight and increasing weakness led him to consult Dr. Munson on September 30. He was emaciated and weak, weighing only 132 pounds and suffering from occasional cramps in the legs and

pains in the lumbar region. Up to this time his diet had consisted almost entirely of carbohydrates, especially the sweeter pastries, cake, etc., there being an especial craving for such foods. He had never been a spirit drinker. Physical examination showed a sound heart and lungs, the liver slightly decreased in size, and the spleen small; there was marked tympanites. The twenty-four hours' urine measured 8,360 c. c.; specific gravity, 1.027; neutral or faintly acid to litmus. No odor of acetone could be detected in the breath or urine, although a small amount was demonstrated in the latter by means of Gunning's iodoform test. Absence of reaction with ferric chlorid indicated the absence of diacetic acid. Eleven per cent of sugar was present, making a daily excretion of 920 gms. The excretion of urea amounted to 67 gms.

The patient was put upon a rigid proteid diet, which was almost immediately followed by a slight reduction in the quantity of sugar excreted, but there was much thirst, frontal headache, and malaise, with diacetic acid and acetone in the urine. His appetite increased, but he continued to lose weight and strength. Insomnia and mental incoherency were present with dyspepsia and vomiting. After nearly five months of this regimen the patient weighed only 108 pounds and was extremely weak. The diet was then changed February 22; carbohydrates were allowed, with eggs, milk, and alcohol, and in a few days there was a marked improvement in his condition. The amount of sugar in the urine became slightly increased, but the diacetic acid was reduced, the cerebral symptoms disappeared, and he began to gain in weight. At the end of six weeks April 9, he had been working in the open air and contracted bronchitis. On this day, for experimental purposes, the patient was put upon a purely meat diet, which was followed by headache and diaceturia. On April 14 dullness with fine crepitation was discovered and the temperature rose to 104.4°. He died April 16.

In view of his study of this case Dr. Munson holds that the presence of a small amount of sugar in the urine while under a proteid diet is of more serious import than a large excretion under a carbohydrate diet, for the splitting up of the proteid gives rise to diaceturia with cerebral symptoms, which may culminate in coma. It must be remembered, however, that this patient, prior to applying for treatment, had become progressively weaker and had lost weight, although he had been living largely on carbohydrates.

The fourth paper by Dr. Munson contains an excellent review of the literature of the subject, and claims that the following hypotheses have been demonstrated:

1. Sugar is always present in the blood.
2. The absence of carbohydrates from the diet does not cause a disappearance of the blood sugar. Hence sugar must have some other source than the carbohydrates ingested.
3. This other source of sugar is the ingested and systematic albumin through a process of decomposition.
4. An increased albumin decomposition due to the rigid enforcement of a purely nitrogenous diet means an increased metabolism and consequent loss of body weight. Hence the cutting off of carbohydrates from the diet directly produces an increased metabolism.
5. Vice versa, the administration of carbohydrates retards metabolism.
6. The diabetic has an especial predisposition toward metabolism.
7. The diabetic has by no means lost the power of burning sugar; therefore sugar must, even more than in health, be allowed in order to prevent loss of weight and muscular weakness, which may culminate in one of the natural endings of diabetes—death by asthenia.
8. The abnormal albumin metabolism, which is especially produced by a rigid proteid diet, results in the production of toxic bodies.

9. The depressed nervous condition of the diabetic is especially favorable for the action of these bodies.

10. The production of toxic bodies is prevented or retarded by the administration of carbohydrates. Hence carbohydrates should be administered to the diabetic to prevent the formation of certain toxic bodies and the severe and often fatal nervous and cerebral symptoms which they induce.

In his fifth paper Dr. Munson explains his views of the production of diabetic sugar. He infers that it is an isomer of ordinary glucose and a product of the decomposition of nitrogenous substances. He sums up as follows:

1. Sugar appears in the urine in health after inordinate ingestion of carbohydrates simply because the capacity of the liver cells to convert a definite amount of sugar into glycogen in a given time is exceeded.

2. Sugar appears in the urine in diabetes because the system produces more sugar by the decomposition of albumin than it can completely oxidize, this sugar not being stored up by the liver as glycogen and being less readily oxidized by the diabetic organism than sugar produced from carbohydrates.

3. It disappears from the urine, if mild cases of diabetes are placed upon a proteid diet, because a withdrawal of all carbohydrates from the diet forces the system to burn the isomeric albumin sugar in the maintenance of the necessary heat and energy.

4. It subsequently appears in the urine under such treatment because with the progress of the affection sugar is produced in quantities too large to be completely oxidized and the diabetic does not appear able to store up this sugar as glycogen.

5. The excretion of sugar by a diabetic, upon a proteid diet, may rise to a certain point upon the ingestion of carbohydrates, since the more readily utilized carbohydrate sugar saves the isomeric albumin sugar from oxidation and the latter is excreted as a waste product.

Dr. Munson's sixth paper discusses diabetic coma and its treatment from the point of view established in the preceding articles of the series.

Surg. Walter Reed, curator of the Army Medical Museum, made some experiments recently with a *Hollister's formaldehyde generator*. The results of these experiments showed that while occasionally an unprotected cover slip spread with S. pyog. aureus and B. diphtheriæ may be destroyed after twenty-three and one-half hours' exposure, the amount of formaldehyde gas furnished by this generator is, as a rule, quite insufficient for the disinfection of either infected clothing or surfaces, even when unprotected.

Kinyoun, as the result of exhaustive experiments with formaldehyde as a disinfecting agent (Public Health Reports, Vol. XII, No. 5, January, 1896), states that no less than 500 c. c. of methyl alcohol should be used for each 1,000 cubic feet of space; time of exposure, twenty-four hours. As the reservoir of the Hollister generator holds only about 1,000 c. c., its supply of gas would appear to be quite insufficient except for the smallest apartments. Dr. Reed's experiments were as follows:

Experiment I.—June 11, 1897. Room cubic capacity, 3,800 feet. All crevices securely closed in windows and doors, and, as an additional precaution, heavy paper pasted over both windows.

A. Three cover slips lightly spread, respectively, with solid culture of B. typhosus, S. pyogenes aureus, and fluid culture of B. diphtheriæ were exposed between the folds of a sterilized towel, suspended on a line at a height of about 7 feet. The edges of the folded towel were held apart so that the gas might have free access to the organisms to be tested.

B. A sterilized handkerchief lightly moistened at its center with a bouillon culture of B. diphtheriæ was loosely wrapped in a second handkerchief and placed in the inside pocket of a coat, which was also suspended from the line.

C. Old agar cultures of S. pyog. aureus, B. typhosus, and B. diphtheriæ were suspended in an inverted position and cotton plugs removed. Time of exposure, twenty-three and one-half hours. Result: A. S. pyog. aureus and B. diphtheriæ, no growth; B. Typhosus, growth. B. Growth. C. Growth in all.

Experiment II.—June 15, 1897. A. Small pieces of a sterilized linen handkerchief were lightly infected with solid and fluid cultures of the organisms mentioned in Experiment I and exposed in open Petri dishes between a folded blanket suspended in the room. The edges and bottom were folded over and pinned so that the gas must penetrate one thickness of dry blanket. B. Pieces of sterilized handkerchief infected lightly with agar cultures of the same organisms exposed in open Petri dishes, protected by one layer of handkerchief, and placed in inside coat pocket. C. Same as in B, except that the open Petri dishes were so placed between folds of a suspended towel that gas would have unimpeded access to infected pieces. Length of exposure, nineteen hours. Result, growth in all.

Experiment III.—June 16, 1897. A. A small piece of sterilized flannel lightly infected with agar culture of B. diphtheriæ, and three cover slips spread with agar culture of the three organisms heretofore mentioned, were exposed in open Petri dishes, protected by one layer of blanket. B. Pieces of sterilized flannel lightly infected with same organisms and exposed in open Petri dishes without protection. Length of exposure, twenty-four hours. Result: (A) After twenty-four hours in thermostat at 37° (cover slips) S. pyog. aureus and B. Typhosus show growth; B. diphtheriæ, no growth. The tube containing the bit of flannel infected with B. diphtheriæ shows no growth. (B) Tubes containing fragments of cloth infected with typhoid and aureus give growth. That containing fragment infected with B. diphtheriæ shows no growth; but after forty-eight hours a growth is found in the tubes which did not show growth at the end of twenty-four hours. (B. diphtheriæ.)

Experiment IV.—June 18, 1897. A. Cover slips and pieces of flannel lightly contaminated with solid cultures of the test organisms exposed in Petri dishes, protected by one layer of blanket. B. The same contaminated with bouillon cultures of test organisms exposed in same manner. C. Pieces of infected flannel exposed unprotected. D. Cover slips infected with agar cultures and exposed unprotected. Length of exposure, twenty-four and one-half hours. Result: Growth in all at end of twenty-four hours except cover slips contaminated with B. diphtheriæ and exposed unprotected. June 21, after forty-eight hours, a growth is found in this tube also.

SURGICAL REPORTS.

Name.	Rank.	Report.
Appel, A. H	Captain and assistant surgeon.	Operation for the radical cure of hernia.
Arthur, William H	do	Appendicitis, death, autopsy.
Banister, J. M	Major and surgeon	Operation for the radical cure of hernia, 4 cases. Summary statement of hernia operations, 6 cases. Operation for the radical cure of hernia, 7 cases.
Banister, W. B	Captain and assistant surgeon.	The Roentgen X-ray traumatism.
Borden, W. C	do	Operation for the radical cure of hernia. Suprapubic prostatectomy for hypertrophy of prostate and chronic cystitis. Varicocele, 2 cases. Fracture of spine, operation, death. Operation for the radical cure of hernia.
Bradley, A. E	do	Hysterectomy, death, autopsy. Renal colic following renal hemorrhage from a fall. Gunshot injury of leg, amputation at knee joint. Two cases of laparotomy, ventro-suspension of uterus, with plastic operation of perineum.
Brown, P. R	Major and surgeon	Poisoning by carbolic acid; death; autopsy.
Crosby, W. D	Captain and assistant surgeon.	Operation for the radical cure of hernia, 2 cases.
DeLoffre, A. A	Major and surgeon	Pneumo-pyo-thorax; operation of thoracotomy. Fissure of anus.
Ebert, R. G	Captain and assistant surgeon.	Gunshot wound of ankle.
Edie, Guy L	do	Operation for the radical cure of hernia, 3 cases.
Flagg, C. E. B	First lieutenant and assistant surgeon.	Skin grafting. Death from aneurism of aorta. Abscess of frontal sinus. Strangulated hernia, operation for radical cure.
Forwood, W. H	Lieutenant-colonel and deputy surgeon-general.	Operation for the radical cure of hernia, 11 cases.
Frick, E. B	Captain and assistant surgeon.	Fracture of tibia and fibula. Ovariotomy. Prevention of vomiting after anæsthesia. Nephrectomy.
Girard, A. C	Major and surgeon	Appendicitis, operation, recovery. Excision of varicose veins. Operation for the radical cure of hernia, 3 cases.
Girard, J. B	do	Gunshot wound of tibia; Krag-Jergensen rifle at short range.

SURGICAL REPORTS—Continued.

Name.	Rank.	Report.
Gorgas, W. C.	Captain and assistant surgeon.	Gunshot wound of tarsus; Krag-Jorgensen rifle.
Hallock, H. M.	First lieutenant and assistant surgeon.	Possible fracture of internal epicondyle without displacement. Strangulated hernia; operation; recovery.
Ives, F. J.	Captain and assistant surgeon.	Acute traumatic tetanus.
Kulp, J. S.	First lieutenant and assistant surgeon.	Appendicitis; operation; recovery.
Kendall, W. P.	Captain and assistant surgeon.	Operation for the radical cure of hernia, 3 cases. Appendicitis; operation; recovery. Fracture of malar bone.
LaGarde, L. A.	Major and surgeon.	Operation for the radical cure of hernia.
Lippitt, W. F.	Captain and assistant surgeon.	Varicocele.
Mason, Charles F.	do	Fracture of clavicle.
Maus, L. M.	Major and surgeon.	Sting of the scorpion of Durango, Mex. Gunshot wound of spine. Amputation of leg; foot crushed by street car.
McCulloch, jr., C. C.	First lieutenant and assistant surgeon.	Abscess of liver; death; autopsy.
McElderry, H.	Major and surgeon.	Operation for the radical cure of hernia, 7 cases.
Munson, E. L.	First lieutenant and assistant surgeon.	New cavalry carbine boot as a field splint.
Phillips, J. L.	Captain and assistant surgeon.	Operation for the radical cure of hernia. Laparotomy for gunshot wound of the pelvis.
Pilcher, J. E.	do	Recurrent sarcoma; excision; paraplegia; death.
Stark, A. N.	First lieutenant and assistant surgeon.	Appendicitis, operation, recovery.
Stone, J. H.	do	Report of a successful cataract operation, 2 cases. Fracture of both bones of leg, 3 cases. Operation for the radical cure of hernia.
Torney, G. H.	Major and surgeon.	Appendicitis, operation, recovery.
Wilson, Wm. H.	First lieutenant and assistant surgeon.	Amputation of arm following gunshot wound.
Woodruff, C. E.	Captain and assistant surgeon.	Gunshot wound of chest, death, autopsy.
Woodson, R. S.	First lieutenant and assistant surgeon.	The pathogenesis of streptococcic infection. Modification of Key's operation for varicocele.

Capt. W. B. Banister, assistant surgeon, Fort Crook, Nebr., forwarded reports of a traumatism caused by exposure to the Roentgen ray. The case is interesting on account of the duration of the exposure and the extent of the resulting lesion. The first report is dated October 15, 1896, and describes the condition of the patient about a month after the "burn" was inflicted. The second or supplementary report was forwarded nearly six months later, April 6, 1897.

CAPTAIN BANISTER'S REPORT.—Captain W. was accidentally shot in the lumbar region to the right of the spinal column, the ball grooving the crest of the ilium. It ranged upward and inward and lodged probably in the neighborhood of the spinal column. Immediate paralysis from the waist downward resulted. There was slight sensation in the left foot within an hour or two after the injury, and the patient was able to lift that foot within two or three weeks. In three weeks he began to have acute pain in the right leg, but could not move it, and was confined to bed for eleven weeks. At the end of a year he could walk with the aid of a cane, and there has been steady improvement ever since. About sixteen months after the injury the use of the left leg was not impaired, but there was some atrophy of the right thigh with paresis of the flexors supplied by the anterior crural nerve. With the aid of a cane he could walk fairly well and had difficulty only in ascending steps. The bullet presumably plowed its way through the dense lumbar fascia and muscles until arrested in its course by the spinal column, and its impact caused sufficient hemorrhage either in the cord or its membranes to temporarily interfere with the functions of the nerves given off below the point of compression. The case had been improving steadily for a year, and there was, therefore, no good surgical reason for attempting the removal of the bullet. While in Chicago he had three exposures to the "X-rays" of one and a half hours each, making four and a half hours in all that the tissues of the skin were subjected to their action. As far as locating the bullet was concerned the result

was negative. Some redness of the skin resulted, but not sufficient to cause any inconvenience. We may conclude, therefore, that the integument can stand an exposure of four hours, divided between two successive days, without material damage. Later the patient underwent further exposures, which were as follows:

Date.	Number of exposures.	Average length of each.	Total exposures.
		Hours.	*Hours.*
September 9	3	1⅓	4
September 10	2	1½	2½
September 11	2	1½	3
September 12	1	1⅓	1⅓
Total			11⅓

There was no result so far as locating the bullet was concerned, but there were other results that left the patient a sadder and a wiser man. The skin began to show the action of the X-rays and the inflammation extended each day during the exposure. The vacuum tube, during the exposure, was held a little below and to the right of the umbilicus. In that situation the epidermis had been destroyed for a space of about one-half the size of a man's hand exposing the red inflamed and hyperæsthetic cutis vera, from which the outpouring of serum was very profuse. A red blush extended from the center in every direction, but principally to the right of the median line and from below upward. The death of the epidermis rapidly extended and large blisters formed beneath it such as occur in scalds. In a few days the denuded surface measured 8 by 15 inches, rectangular in shape, the largest diameter being from above downward. The superficial layer of the cutis vera was thrown off, leaving a raw, bleeding surface, and the quantity of serum (with some pus) that exudes is astonishing. The lesion extends upon the thorax to the level of the right nipple. The patient has been confined to the bed for a month and the denuded surface is so hyperæsthetic that he could not stand the application of the gauze and absorbent cotton dressing, and it was necessary to cover the surface with perforated gutta-percha tissue. No drying or astringent powders seem to have any effect in checking the outpour of serum, which is quite an annoyance to the patient. His beard is naturally dark brown in color, but since the prolonged exposure to the X rays no beard at all has grown on the chin where formerly a goatee flourished, and the rest of the beard on the right side which was in the line of the ray has turned white or light yellow. The integument of the chin was reddened, but the epidermis was not destroyed. During the exposure the patient sat with the right hand grasping the rounded end of the arm of a chair. It can readily be seen by trial that if one grasps with the right hand the arm of a chair in a natural pose, that the dorsal surface of the fingers turn outward and forward while the dorsal surface of the last phalanx of the thumb turns forward and inward, and in that position would be impinged upon by the X-rays at a right angle; at least that is the only explanation of the fact that the integument over the dorsal aspect of the last phalanx of the thumb was reddened, and it seems quite likely that the nail will be lost. It would seem that the rays impinging upon the tegumentary surface at very acute angles produce no irritating effect, for the curved lateral aspect of the abdomen which must have been impinged upon by the rays showed no sign of irritation, while the thumb, which was further removed from the focus of irritation, was affected.

The intensity of the irritation seemed to be in proportion to the approximation to a right angle at which the rays impinged upon the tegumentary surface. In that respect the Roentgen rays seem to resemble heat rays. As the X-rays pass through the body it is strange that no irritating effect is produced upon the peritoneum, a much more delicate membrane than the skin. This fact would lead me to believe that the inflammation of the skin resulting from the X-ray is due to the action of the X-ray on the terminal nerve filaments in the skin, probably the vaso-motor nerves, as the structure that receives the full intensity of the rays is the only one affected. It is therefore a change in the nutrition of the tissues. The patient wore a light-weight undershirt during the exposures and felt no heat or pain during the passage of the rays through the skin. This absence of apparent effect might in itself be a source of danger in using the X-rays about the face, as it can readily be seen that it might so seriously inflame the delicate conjunctiva as to even imperil the integrity of the cornea. Again, it might cause the permanent loss of eyebrows and eyelashes and thus disfigure the patient. On the other hand, the X-ray might with great advantage be used to remove hairy growths for a cosmetic effect, and with a good prospect of the hair not returning.

Supplementary report.—In the report on a lesion resulting from the use of the X-ray in the case of Captain W., written October 15, 1896, some erroneous conclusions were

reached which further observation of the case enables me to correct. My excuse for submitting a further report on this case, covering a period of six months and up to the time the patient passed from under my observation, is my desire to place on record a case of X-ray burn which has no parallel in medical literature up to date, either in the length of exposure (eleven and five-sixths hours) or in the extent (15 by 8 inches) and intensity of the resulting lesion. It must prove of interest as illustrative of the effect of the X-ray when pushed to extremes, as no exposures of such length will probably occur again. In a recent letter from a surgeon in charge of an X-ray laboratory in Chicago he informed me that they made exposures now of only ten minutes' duration. In my first report I made the prognosis that the lesion would heal in two months, a prognosis based on similar lesions, such as superficial burns, etc. In this opinion I was in error, as further experience demonstrated to me that there are no similar lesions, and any prognosis based on apparently similar precedents would necessarily be erroneous. At the end of six months the lesion has not healed, though the original extent has been reduced from 15 by 8 inches to 8½ by 3 inches, and it will yet be many months before the patient will be cured. The beard, which I reported as having fallen out and showing no signs of returning, did return in about six weeks from date of injury, and was noticeably thicker and coarser than before. The hair on the thorax and abdomen, where healing has occurred, has not returned. The entire denuded surface was covered with a false membrane which in places was from a quarter to half an inch thick and thrown into folds. The central portion of the lesion presented an open ulcer involving the entire thickness of the skin down to the superficial fascia. The most distressing feature of the case is the intense pain, which nothing but morphine will control, and which seems to have no relation to the extent of the lesion, as it is as intense now as it was four months ago, when the denuded surface was much larger. The use of morphine is much to be deprecated in a case of this character, where every nutritive function and all emunctories should be at their maximum of efficiency, but the pain is unbearable, and the patient can secure no rest without it. The slowness with which this apparently superficial denudation heals is almost incredible. It must be in great part superficial, for nearly 100 square inches have healed without any cicatrix, but what remains must heal by cicatrization by reason of the depth of the ulceration.

Treatment.—Ointment of oxide of zinc; 1 per cent icthyol; one-half per cent icthyol in ointment of oxide of zinc; castor oil locally; aristol dusted over the surface; hot applications; protonuclein locally and internally; 4 per cent solution of cocaine hydrochlorate; hot baths once or twice a day; lanolin. With all these applications, the surface was cleaned with corrosive sublimate solution, 1 to 1,000, but its effect was feeble antiseptically, and unsatisfactory, probably owing to the fact that the surface was constantly bathed in serum, which neutralized its effect. None of these agents were of any permanent benefit, as far as controlling the pain was concerned, but all probably assisted to some extent the healing process, though no one seemed to have any more favorable effect than the others, except the aristol. The cocaine solution entirely stopped the pain for two days, and then was of no use. The hot baths modified the pain and diminished the frequency of the paroxysms more than anything else, but owing to the location of the lesion the patient could not have the surface immersed in hot water for a sufficient length of time, as it caused faintness. The pain of such a lesion, situated on an extremity which could be submerged for one or two hours at a sitting, could in all likelihood be entirely controlled. The use of the hot bath was suggested to me by a surgeon who was burned by the X-ray on the wrist and found relief in that manner. The aristol cleaned off the false membrane, lessened the odor from the gangrenous tissue, and gave the ulcerated surface a more vivified, healthy-looking appearance than anything else. A tough, yellowish, cheesy-looking material formed in the center of the ulcer early in its history and seemed to extend to some depth, and the upper surface would become gangrenous and looked soft enough to be readily curetted off, but in attempting to do so it was found almost as tough as leather. The patient often complained that this cheesy mass felt as if a block of wood had been let into the abdominal wall. One case has been reported where this false membrane was curetted off, but an indolent ulcer resulted that was intractable. Another case has been reported in which skin grafting was tried, but with no benefit. There would seem to be no reasonable prospect of success in attempting skin grafting on a surface covered with false membrane, and as curetting off the false membrane did more harm than good in the one case in which it was tried, and as the lesion in my case was healing slowly, very slowly, but steadily, I thought it best to banish meddlesome surgery, particularly as none of the cases reported compared in extent or severity with this one.

I have had reports of 4 cases in private letters, and all complained bitterly of the peculiar, unbearable pain that accompanied the healing process. At first there is scarcely any pain, but when in the reparative process the terminal nerve filaments begin to be regenerated, then this distressing feature is very much in evidence.

A constant and critical observation of the effect of the X-ray in this case for six months forces me to the conclusion that the lesion is not due to the luminous X-ray

per se, but to some other factor not yet isolated. Considering the intensity and degree of the irritation to the integument, it is not possible that, if the X-ray caused it per se, it could pass through such a delicate membrane as the peritoneum, or such delicate organs as the kidney or liver, all of which it traversed in this case, without producing signs of irritation in them, inflammation, or death. If by any chance it specialized its effects on the skin, it should have inflamed the integument where it emerged at the back of the patient certainly to some proportional extent to the severe injury it inflicted on the integument at the front of the patient, where it first impinged. In my first report, written last October, I invited attention to the fact that the intensity of the irritation was greatest where the rays struck the surface perpendicularly, and noted the resemblance in that particular to the effect of heat rays, and I believe future investigations along that line will discover the real agent in the production of these lesions.

The patient became so tired of his surroundings and so desirous of an entire change that it was considered advisable to comply with his wishes, and he left this post April 4 for admission to a private hospital in Chicago. The lesion had decreased in six months from 120 square inches to about 24 square inches, which will compare very favorably with results in similar cases when their relative proportions are considered.

SURGICAL OPERATIONS.

During the year 1896 the Medical Department of the Army reported 542 surgical operations, 142 of which were necessitated by injury and 400 by disease. The number, character, and results of these are shown in the following statement:

Nature of operation.	Disease or injury.	Total.	Recovered.	Died.	Remarks.
Removal of tumors		**50**			
Enucleation	Sebaceous, 10; encysted, 11; lipoma, 7; fibroid, 8; epithelioma, 1; lupus vulgaris, 3; chalazion, 3; enchondroma, 1; ganglion, 1; angioma, 2; hæmatoma, 1; epithelial, 1; sarcoma, 1.	50	50	.....	Scalp, 6; neck, 4; back, 3; hand, 4; lip, 2; wrist, 1; cheek, 4; nose, 3; chest, 1; axilla, 1; arm, 1; chin, 2; knee, 4; eyelid, 5; eyebrow, 4; ear, 4; not stated, 1.
Opening of abscesses		**69**			
Incision	Adenitis, 3; cellulitis, 10; bubo nonvenereal, 12; ischio-rectal, 5; tonsillar, 1; carbuncle, 2; whitlow, 3; venereal, 1; bubo, venereal, 8; rectal, 1; periosteal, 1; sinus nonvenereal, 1; subcutaneous, 17.	65	65	.....	Groin, 25; abdomen, 6; finger, 3; thumb, 1; neck, 3; hand, 3; tonsil, 1; foot, 1; cheek, 1; axilla, 1; perineum, 1; knee, 1; elbow, 2; penis, 1; alveolar, 3; face, 1; buttock, 4; eye, 1; back, 2; thigh, 2; forearm, 1; chest, 1.
Incised and curetted	Bubo, venereal, 2; adenitis, 2.	4	4	.....	Groin, 2; neck, 1; axilla, 1.
Operations on the eye		**16**			
Enucleation		4	4	.....	
Foreign bodies		4	4	.....	
For pterygium		6	6	.....	
For glaucoma		1	1	.....	
For internal strabismus		1	1	.....	Operation on civilian attaché.
Operations on the nose		**16**			
For enchondroma of nasal septum.		2	2	.....	
For hypertrophic rhinitis		4	4	.....	
For chronic rhinitis		5	5	.....	
For hypertrophy of turbinated bones.		4	3	1	Death from aneurism of thoracic aorta.
For hypertrophied septum		1	1	.....	
Operations on the mouth		**14**			
Amputation of uvula		3	3	.....	
Removal of tonsils		3	3	.....	
Removal of adenoid growths of pharynx.		8	8	.....	Civilian attachés: Adult males, 3; adult females, 5.

Surgical operations—Continued.

Nature of operation.	Disease or injury.	Total.	Recovered.	Died.	Remarks.
Operations on the ear		**1**			
Drum punctured	Acute abscess middle ear.	1	1	.....	
Operations on the veins		**21**			
For varicocele		17	17	.....	Excision, 14; ligation, 3.
For varicose veins of leg		4	4	.....	Excision, 4. (One case adult female, civilian attaché.)
Operations on the arteries		**2**			
Ligation of anastomotica magna.	Punctured wound, right thigh.	1	1	.....	
Ligation of an abnormal branch of the superficial epigastric.	Troublesome hemorrhage after incision of nonvenereal bubo.	1	1	.....	
Operations on the digestive organs.		**119**			
For fistula in ano		14	14	.....	
For rectal fistula		2	2	.....	
For abscess of rectum		1	1	.....	
For prolapse of rectum		1	1	.....	
For fissure of anus		1	1	.....	
For warty vegetations of anus.		1	1	.....	
For hemorrhoids		51	51	.....	Incision, 33; ligature, 12; thermo cautery, 1; injected with carbolic acid, 1; clamp and cautery, 3; internal cauterization, 1
Reduction and manipulation of hernia under ether.		2	2	.....	
Laparotomy	Appendicitis, 12; gunshot wound of abdomen, 1; subhepatic abscess, 1; for radical cure of hernia, 30; *a* for ventral hernia, 1; volvulus, 1.	46	40	*b* 6	*c* Bassini's operation, 19; Bassini's operation (modified) 9; Halsted's operation, 1; not stated, 1.
Operations on the respiratory organs.		**3**			
Aspiration of chest	Acute pleurisy	3	3	.....	
Operations on the lymphatic glands.		**39**			
Removal of glands	Venereal, 21; bubo nonvenereal, 3; nonspecific adenitis, 5.	29	29	.....	
Curetting	Venereal, 7; nonvenereal bubo, 1; nonspecific adenitis, 2.	10	10	.....	
Operations on the urinary organs.		**9**			
For strictures of urethra, internal urethrotomy.	Gonorrhea, 5	5	5	.....	
Dilatation	Gonorrhea, 2	2	2	.....	
Meatotomy	Gonorrhea, 1	1	1	.....	
Prostatectomy	Hypertrophy of prostate, 1.	1	1	.....	
Operations on the generative organs.		**51**			
For phymosis	Congenital, 15; gonorrhea, 7; chancroid, 3; ulcers of prepuce, 1.	26	26	.....	Children, 2 cases (civilian attachés).
For hydrocele		5	5	.....	Aspiration, 3; Volkmar's operation, 2.
For fistula epididymal, incised and curetted.		1	1	.....	
Curetting of uterus	Chronic endometritis.	9	9	.....	Adult females, 9 (civilian attachés).
Trachelorrhaphy	Laceration of cervix uteri.	6	6	.....	Adult females, 6.
Perineorrhaphy	Lacerated perineum.	2	2	.....	Adult females, 2.
Vaginal section	Pyosalpinx	1	1	.....	Adult female, 1.
Elytrorrhaphy	Rectocele	1	1	.....	Adult female, 1.

a Adult female, civilian attaché, 1.
b Deaths from appendicitis, 4; from volvulus, 1; from gunshot wound of abdomen, 1.
c Civilian attachés, children, 2 cases.

Surgical operations—Concluded.

Nature of operation.	Disease or injury.	Total.	Recovered.	Died.	Remarks.
Operations on the bones		**16**			
Removal of portions	Exostosis, 2; gunshot wound, 1; fracture of skull, 1.	4	3	1	Femur, 1; parietal bone, 1; forearm, 1; metatarsal bone, 1.
Osteotomy	Ostoitis, tibia, both legs.	1	1	.....	
Trephining	Cerebral hemorrhage from a fall.	1	.....	1	
Reduction and manipulation of fractures.	.....	10	10	.....	Clavicle, 3; tibia, 1; fibula, 1; tibia and fibula, 1; metatarsal bone, 1; Colles' fracture, 3.
Operations on the joints	.....	**30**			
Reduction of dislocations	.....	27	27	.....	Shoulder, 15; knee, 1; thumb, 2; elbow, 3; ankle, 1; scapula, 1; hip, 3; metacarpal, 1.
Disarticulation of joint	Gunshot wound	1	1	.....	Finger, 1.
Aspiration	Synovitis	1	1	.....	Knee, 1.
Incision and drainage	Bursitis	1	1	.....	Knee, 1.
Operations on the limbs	.....	**40**			
Amputation for injury:					
Thumb	Injury, 2; gunshot, 1	3	3	.....	Primary, 2; secondary, 1.
Fingers	Gunshot, 9; accident, circular saw, 6; frostbite, 1; burn, 1; accident, planing machine, 1; railroad accident, 1; jammed by a door, 1; crushed by a beam, 1.	21	21	.....	Primary, 17; secondary, 4.
Thigh	Railroad injury, 3	3	1	2	Primary, 1; secondary, 2.
Leg	Railroad injury, 1	1	1	.....	Primary, 1.
Foot	Accident, axe, chopping wood.	1	1	.....	Primary, 1.
Toes	Gunshot, 3; frostbite, 2; accident, axe, chopping wood, 2.	7	7	.....	Primary, 6; secondary, 1.
Amputation for disease:					
Leg	Necrosis of tibia, 1	1	1	.....	Secondary, 1.
Toe	Hammer toe, 2	2	2	.....	Primary, 2.
Finger	Whitlow, 1	1	1	.....	Secondary, 1.
Operations on the tendons and muscles.	.....	**3**			
Incision of tendon	Overlapping toe, 1; contracted tendon, finger, 1.	2	2	.....	
Suture of tendon	Tendon extensor pollicis, divided by a knife while cooking, 1.	1	1	.....	
Operations on the skin, etc.	.....	**43**			
Ingrown nails, excision of nail.	.....	29	29	.....	
Ingrown nails, partial excision of nail.	.....	7	7	.....	
Removal of foreign bodies	.....	7	7	.....	1 case, adult female (civilian attaché).

Some details of certain of the surgical cases reported are herewith given as of interest in showing the character of the surgical service at military posts in times of peace.

Capt. E. B. Frick, assistant surgeon, Presidio of San Francisco, Cal., has presented in tabular form some observations on the use of inhalations of the acetum aromaticum, N. F., for the prevention of vomiting after anæsthesia. He states that in many of the cases he was present as operator or assistant, while in the others the facts were gathered from the records of a private hospital in San Francisco. The aromatic vine-

gar was administered by inhalation from a saturated handkerchief as soon as the anæsthetic was discontinued, and was kept up for an hour or longer if called for by the occurrence or persistence of nausea or more active gastric disturbance.

Operation.	Anæsthetic.	Amount administered.	Duration of anæsthesia.	Remarks
		c. c.	*Hours.*	
Removal of appendix vermiformis.	Chloroform		1	Nausea, no vomiting.
Do	do	35	1	No vomiting nor nausea.
Do	do	60	1½	Do.
Amputation of toe	do		¼	Do.
Curettage of uterus	do	15	½	Do.
Ovariotomy	do	20		
	Ether	120	1½	Do.
Herniotomy	Chloroform	8		
	Ether	150	1	Do.
Drainage of intramural abscess of uterus.	Chloroform	50	2	Do.
Hysterectomy	do			
	Ether		3	Do.
Cholecystotomy	Chloroform	30		
	Ether	360	3½	Do.
Removal of appendix vermiformis.	Chloroform		1½	No vomiting after operation; stercoraceous vomiting before operation.
Nephrectomy	do	50	2½	Nausea, no vomiting.
Ligation of varicose veins of leg.	do	20		Nausea, no vomiting.
	Ether	300	1½	
Curettage of uterus	Chloroform		½	No vomiting until 4 hours after operation, patient was given 250 c. c. of tea, which was followed by vomiting; 8 hours after the operation patient was given 250 c. c. of broth, and vomited again; also vomited again 10 hours after operation.
Herniotomy	Chloroform	35	1	½ hour after operation patient vomited frequently for about 15 minutes.
Cholecystotomy	do	50	2	4 hours after operation patient vomited; inhalations of aromatic vinegar given again and no further vomiting took place.
Removal of ossicles of ear.	Ether	240	1½	Patient vomited frequently, notwithstanding persistent use of inhalations of aromatic vinegar.
Herniotomy	Chloroform		2	No vomiting. About 10 hours after operation there was nausea, which was relieved by inhalation of aromatic vinegar.
	Ether			
Curettage of uterus	Chloroform		½	Patient vomited several times notwithstanding the inhalation of aromatic acetic acid, but the inhalation was not begun until about an hour after the operation.

Reports of two cases of extraction of cataract were received from Lieut. J. H. Stone, assistant surgeon, Fort Riley, Kans.:

Private J. S., Troop D, Second Cavalry, was struck in the right eye by a twig while herding horses in the Creizo Mountains, New Mexico, June, 1892. A plastic iritis ensued, and the lens soon became opaque. He consulted me and desired to have the cataract removed. With the permission of the surgeon, I accomplished this in two operations. The first consisted simply in detaching the adherent iris from the lens capsule. On January 28, 1897, after antiseptic precautions had been taken, the eye was cocainized, the upper incision made, and the cataract removed. None of the possible accidents of the operation happened, and the bandages and dressings were removed on the seventh day. He was not able to count fingers, on account of a little cortical matter which had not been evacuated. This has been absorbed, and now (March 1) he is able to count fingers and distinguish objects very readily at 18 inches. Examination for glasses has not yet been made.

Mrs. S., aged 45 years, consulted me for a traumatic cataract of the left eye. The lens became opaque as a result of a blow which she received some eight years ago. All antiseptic precautions were taken, and with the kind advice and assistance of Capt. J. L. Powell, assistant surgeon, the cataract was removed by an upper incision, without doing an iridectomy. Cocaine was used. On the fourth day the

bandages and pads were removed from both eyes, and the corneal wound was found to be healing nicely. The patient could count fingers at 10 inches and distinguish objects across the room (10 feet) with the left eye. The dressings were reapplied to the injured eye only, and were removed daily to permit of the use of boracic acid solution and atropin until the twelfth day, when they were discontinued.

Capt. Frank J. Ives, assistant surgeon, reported from St. Francis Barracks, Fla., a case of tetanus, which proved fatal on the seventh day after the appearance of suggestive symptoms. Antitoxic serum was not available until the sixth day.

A private of Battery M, First Artillery, age 22, cut himself on the right foot January 11, 1897, while chopping wood. The ax cut through the tissues to the bone on the inner side of the metatarso-phalangeal joint of the great toe. The injured man reported immediately at the hospital, where the wound was washed with an antiseptic solution and its edges were united, with every caution against infection. The stitches were removed on the sixth day, and the wound had united by first intention.

On the evening of January 20, this soldier complained of a slight pain in the back of the neck and stiffness in the jaw. This was reported to the surgeon, at his visit to the ward the following morning when some trismus was observed; temperature and pulse normal. The wound appeared normal but was at once opened and thoroughly disinfected and dressed three times daily with a moist bichloride dressing. It healed rapidly by granulation from the bottom and in three days had completely united once more. Chloral hydrate 0.650 and potassium bromide 2.000 were administered three times a day. There being no tetanus antitoxin on hand it was asked for by telegraph.

January 21.—Trismus well developed; jaws tightly locked, muscles of chest and back tense; slight pain in back; temperature and pulse normal, mind clear.

January 22.—Trismus unchanged, in fact this remained so throughout the entire course of the disease. Slight tetanic convulsions attended by considerable pain and opisthotonos recurring every half hour. Bowels moved by saline cathartic. Nourishment consisting of milk and beef tea administered freely and readily taken. Temperature normal, pulse 100 strong, face flushed, mind clear, profuse perspiration, treatment unchanged. Morphine sulph. 0.016 hypodermically at 9 p. m. was followed by several hours sleep.

January 23.—All symptoms slightly intensified; temperature 100°, pulse 110; convulsions more frequent, recurring every ten minutes. Morphine sulph. hypodermically at 10 a. m. and 9 p. m. again followed by several hours sleep.

January 26.—All symptoms somewhat intensified; temperature at no time went beyond 100°; pulse 120 and feeble. Convulsions although not severe in character were more frequent, recurring at intervals of less than a minute, lasting however but a few seconds, attended by great pain. Owing to the growing weakness of the heart the chloral hydrate had been discontinued the previous day. At 12 m. tetanus antitoxin serum c. c. 25 was administered hypodermically. This was followed by no appreciable change; there was no rise of temperature, and the pulse remained the same. At 6 p. m. antitoxin serum c. c. 25, and at midnight another dose. General condition seemed somewhat improved at midnight. Tincture digitalis, c. c. 0.5 every four hours.

January 27.—Slight diminution in intensity of convulsions; pulse 120, and weak. Antitoxin serum c. c. 25 at 9.30 a. m., digitalis c. c. 0.5 every two hours. At 12 m. a sudden attack of syncope occurred. The prompt administration of stimulants in the shape of brandy at first hypodermically and then by mouth revived him. He rallied from this attack, but his pulse was rapid and compressible. Brandy and digitalis were administered every two hours. At 6.40 p. m., another attack similar to the previous one took place and the patient died suddenly.

Capt. James E. Pilcher, assistant surgeon, Columbus Barracks, Ohio, reported a case of recurring tumor which was considered to be an alveolar sarcoma of the small round-cell variety. The patient became paraplegic, and died from general pyæmic infection.

Sergt. D. D., Company F, Seventeenth Infantry, was admitted to hospital at Columbus Barracks, October 14, 1896, presenting a tumor in the left lumbar region. Inquiry elicited the following:

First two operations: He had been in hospital at Fort D. A. Russell twice, each time presenting a tumor in the left loin, and each time it was diagnosticated as a fatty tumor and excised, the last excision occurring about a year and a half previous to the date above noted.

Third operation: On March 14, 1896, he had been admitted to hospital at Columbus Barracks for a swelling about 3 by 2 inches projecting in the same locality as

those previously removed. There was no pain and the enlargement was of rapid growth and attributed by the patient to a strain to which he had been subjected a week or two previously. Four days later, under ether, the tumor was cut down upon by Lieut. Col. W. E. Waters, deputy surgeon-general, and found to consist mainly of a hæmatoma, but subjacent was a mass of fatty appearance, supposed from the history and its microscopical appearance to be a small lipoma. The clots were turned out, the lipoma removed, and the wound closed, all under antiseptic precautions, resulting in primary union of the wound. The patient went to duty April 1, 1896, two weeks after the operation.

Fourth operation: On October 14, 1896, as stated at the beginning of this report, he was admitted to the Columbus Barracks hospital with the foregoing history and presenting a recurrent tumor on the site of those previously removed but much larger, the base occupying an oval space 7 by 5 inches, with the short axis parallel to the spinal column. The tumor was, on palpation, found to be distinctly lobulated, and from its rapid, although painless growth, and its recurrence in the site of previous traumatism, was thought to be clearly malignant and probably sarcomatous. On October 22, under ether, it was removed by Capt. James E. Pilcher, assistant surgeon, under the direction of Lieut. Col. W. E. Waters, deputy surgeon-general. It was overlaid by a thick layer of fat, which, with the excessive hemorrhage always characteristic of the excision of sarcomata, somewhat complicated the operation. When removed the neoplasm measured 6 by 4 by 3 inches, and was encapsulated and lobulated. It was distinctly a growth from the subcutaneous connective tissue, and involved neither the skin above nor the muscles underneath, although it occupied the entire space between the latissimus dorsi and the skin. The removal of so extensive a mass left so large a cavity that it was thought unlikely that primary union would be obtained although the operation was done with the most conscientious asepsis; but we were happily disappointed, for union by first intention occurred throughout, except at the internal corner of the wound, where a slight accumulation of serum ensued in a small cavity left at that point; this cavity, however, promptly filled up and the patient was returned to duty November 18, entirely cured.

The tumor was examined at the pathological laboratory of the Ohio Medical University by Prof. H. C. Fraker and pronounced to be an alveolar sarcoma of the small round-cell variety.

On December 23, 1896, Sergeant D. was again admitted to hospital, this time complaining of severe pain in his loins. Examination showed no trace of recurrence at the old location, nor indeed was there any further recurrence during the remainder of his life. The idea of metastasis and pressure naturally arose, but as no external evidence was apparent, a tentative diagnosis of acute lumbago was made and suitable treatment applied, by which he appeared to be so much relieved that he was returned to duty again a week later. Three days afterwards, however, he again appeared with the same pain, and he was placed under observation with suitable anodynes to give him rest when needed. These pains were not constant nor were they periodically intermittent, but were paroxysmal at irregular intervals, never occurring at first more than once a day and often presenting intermissions of one or two days. The patient was subjected to general tonic treatment and the pains treated symptomatically.

On February 4, anæsthesia of the lower extremities appeared, followed two days later by paralysis of both lower limbs, the rectum, and anus, indicative of pressure upon the lumbar portion of the spinal cord. Upon consultation with Lieutenant-Colonel Waters, it was determined to ask Dr. D. N. Kinsman, professor of nervous and mental diseases in Starling Medical College, and a neurologist of wide experience, to see the case. Dr. Kinsman examined him February 7 and confirmed the opinion above expressed, adding that the paralysis was probably due to the encroachment of the neoplasm, most likely sarcomatous, upon the cauda equina at the level of the third or fourth lumbar vertebra.

The question of the propriety of an attempt to remove the supposed growth by laminectomy was considered, but finally rejected for four reasons: (1) The operation, exceedingly severe in any part of the spine, would be excessively so in case of the deep-set and strongly built lumbar vertebræ, and would endanger the life of the patient, a fact which would have been especially true in this patient because of the presence of a very thick layer of subcutaneous fat; (2) the doubt as to the ability to relieve the trouble even after the spinal canal was opened; (3) the doubt as to the correctness of the diagnosis of a tumor in the locality supposed; (4) the fact that even were the diagnosis correct, the supposed neoplasm removed, and the operation successful, it would in any event only postpone inevitable death for a short time and add but a brief period of suffering to the patient's life.

Bed sores appeared on the 7th, and upon the 16th gangrene appeared in both heels and the right great toe, the latter gangrenous foci, however, never enlarging to any great extent. The gangrenous points in the buttocks increased until large sloughs produced deep suppurating cavities. General purulent infection ensued, metastatic

abscesses of the lungs developed, and upon the 27th the patient fell into a condition of pyæmic coma in which he died upon the 28th.

The autopsy performed by Captain Pilcher, under the direction of Lieutenant-Colonel Wateis, consisted of a laminectomy such as would have been done had operation been decided upon during life. Resection of the lumbar laminæ showed anæmia and atrophy of the contents of that portion of the spinal canal, but no distinct tumor was present, although there was considerable osseous constriction at the level of the third lumbar vertebra. No projection into the canal could be detected above or below this point. The autopsy then confirmed the propriety of the rejection of laminectomy during life, since there was no growth to remove.

The operation for varicose veins which appears to have met with favor in the experience of Army medical officers is that of cutting down on the veins, tying and excising them. This was done in varicose veins of the leg by Maj. A. C. Girard, surgeon, Fort Douglas, Utah, and in cases of varicocele by Capt. W. F. Lippitt, jr., assistant surgeon, Fort Leavenworth, Kans., and Capt. W. C. Borden, assistant surgeon, Fort Snelling, Minn. The last-named officer objects to subcutaneous ligation on account of the difficulty of isolating the vas deferens and at the same time including all the veins that require to be ligated. In one case he operated three times before obtaining a cure. Usually also there is considerable pain for three or four days after the operation, and the individual is not able to resume his duties any sooner than when the radical method is adopted. The open operation allows inspection of the parts, so that the tying and removal of the veins may be done with precision. This, with the absence of pain after the operation, the aseptic healing, and the surety of cure, makes the open operation greatly to be preferred.

Dr. Girard's case.—Private J. F., Sixteenth Infantry, was admitted to hospital July 16, 1896, for varicose veins. Is 33 years old, fourteen years in service. Stated he had suffered from varicose veins of the right leg for eight or nine years, and that the varicosities have become steadily worse and are now beginning in left leg. He has worn a rubber bandage with but partial relief. Veins cause so much pain now that he can not drill on double quick or march. Enlisted the last time December, 1892, by special authority from Adjutant-General's Office. On examination the internal saphenous vein was found greatly enlarged up to several inches above the knee joint, the veins of the calf of the leg forming a tumor. On being told that an operation might prove a relief, he expressed a desire to have it performed.

The leg was shaved, scrubbed with soap, ether, and bichloride solution. Anæsthetic: Ether. An incision 4 inches long was made over the most prominent part of the vein on a level with the knee joint, and 4 inches of the vein and its branches carefully dissected off and severally ligated with catgut and excised. The main trunk was about the size of a finger. There was scarcely any bleeding. The skin was united by interrupted sutures.

More difficulty was experienced in excising the veins of the calf of the leg on account of their numerous enlarged branches, and an incision had to be made perpendicular to the longitudinal incision of 5 inches first made to make room to follow up the ramifications. A large number of catgut ligatures was needed after the principal veins had been ligated and excised to finally control the hemorrhage. The skin was united as above. Dressing: Iodoform gauze. The temperature rose slightly for four evenings; otherwise there was no particular untoward event to delay the cure. The upper incision healed per primam. The point of the flap of the lower wound sloughed off and left a granulating wound which cicatrized rather slowly. Returned to duty September 21, 1896.

Dr. Lippitt's case.—Private A. A., Sixth Cavalry, was admitted to hospital May 2, 1897, for varicocele, left side. On May 3, 1897, the pubes and scrotum having been shaved and dressed with a poultice of bichloride (1–1,000) in the morning, he was anæsthetized at 2 p. m., the anæsthetic (chloroform and ether) being administered by Acting Hospital Steward A. I. Neily.

An incision 1½ inches long was made along the line of the cord from the external ring down. The cord was isolated, and the vas deferens and its attendant vessels separated from the enlarged veins. A double silk ligature was passed around the surplus vessels, separated for about an inch, and tied at each end. The intermediate portion was excised, and the divided ends approximated by tying together the long ends of the ligatures, thus shortening the cord. The skin incision was sewed up

with silkworm gut and dressed aseptically. There was slight swelling of the testicle, which disappeared in ten days after the operation. At the end of a week the wound was dressed and found to have united per primam. The patient was returned to duty May 26, 1897.

Dr. Borden's cases.—W. B., age 17, reported at this hospital for examination for enlistment December 28, 1896. On examination he was found physically qualified with the exception of a rather large varicocele of the left side. There was no atrophy of the testicle, and he affirmed that he experienced no inconvenience or pain. From its size I judged it disqualifying as liable to produce trouble in the near future, and informed him that an operation and cure of the varicocele was necessary before he could be accepted as a recruit. He readily consented to operation and I operated January 4, 1897, assisted by Capt. H. A. Shaw, assistant surgeon. The pubes and scrotum were shaved the evening before, and a wet bichloride dressing was applied and not removed until the time of operation. Ether was given by Hospital Steward A. Nickel. The usual aseptic preparations and precautions were used. An incision about 2 inches long was made over the left anterior part of the scrotum, and carried down to the enlarged veins. These were isolated from the vas deferens and ligated en masse by two catgut ligatures sterilized by the Benkisser method; one passed around the veins at the upper extremity of the incision and one at the lower. The ends of the catgut were left long, the veins between the two ligatures were excised, after which the two stumps were brought into apposition by tying the two ligatures. In isolating the veins, the tunica vaginalis was inadvertently opened and the opening was closed with fine catgut. The skin was united by horsehair sutures, a drain of several strands of catgut being placed in the lower end of the incision, and a dressing applied. The drain was used from the fear that owing to the well-known difficulty of rendering the scrotal integument aseptic there might have been some infection of the wound. There was, however, no infection, the temperature not rising above 100° F., and being normal on the fourth day. The dressing and skin sutures were removed on the sixth day, when the wound was found united throughout except at the place of insertion of the catgut drain. The drain having been made of coarse catgut (No. 8) was moist, and the part within the wound had not been absorbed. It was removed and a small dressing applied. On examination the next day the opening was found closed, and the patient left the hospital January 16, 1897. There was no pain following the operation, nor has there been discomfort of any kind since. A decided induration of the tissues could be felt at the point of approximation of the two stumps left after the excision of the intervening veins. From the shortening caused by bringing the cut ends together, the left testicle now hangs higher than the right. On January 24 his condition was such that I considered him fit for service and made out his papers accordingly.

The second case is that of a soldier of the Second Infantry, who was admitted to this hospital December 8, 1896, by order of the department commander, for observation and treatment, his certificate of disability having been forwarded on account of "neurasthenia and hypochondria. He suffers from headache and pain in the left hypochondriac region, with palpitation of the heart after exertion. His vision is hypermetropic; the left testicle is pendulous and has slight varicocele. He was unable to march upon the practice march of sixteen days." He was carefully examined by the chief surgeon of the department, Lieut. Col. H. R. Tilton, deputy surgeon-general, by Maj. C. B. Byrne, surgeon, by Capt. H. A. Shaw, assistant surgeon, and myself, and the diagnosis as given above was confirmed. It was suggested that while operative treatment of the varicocele was not strictly indicated, that it could be cured by such treatment, and that the operation from its effects upon his mind might also benefit his neurasthenia and hypochondriasis. He readily consented to operation, and I operated January 7, 1897, assisted by Capt. H. A. Shaw. Preparation and operation were as in the case first reported except that the varicocele not being as large and the veins not so bunched, they were tied separately as they appeared spread out in the fascia, and then, instead of excising them, a purse-string suture was passed in and out through the fascia and then drawn tight and tied, so bunching all together and drawing the tissues up as much as though an excision had been made and the cut ends approximated. Convalescence was uneventful except for occasional attacks of priapism caused by tightness of the bandages. His temperature did not go above 99.6° F., and was normal on the sixth day. The dressing and stitches were removed on the fifth day, when the wound was found entirely dry and healed throughout. The part of the catgut drain which had been inserted had been absorbed and the outer end was lying dry upon the skin. This was due to the drain having been made of fine (No. 1) catgut, the strands being smaller than those used in the first case were more easily and quickly broken down and absorbed by the leucocytes. The patient was allowed to get up on the sixth day, and a suspensory bandage was applied. There is now some subcutaneous induration of tissue at the point of operation, but the varicocele is completely cured. Unfortunately, however, the operation seems to have had no effect upon his neurasthenia or hypochondriasis.

A case of aneurism of the thoracic aorta undiagnosed during life was reported by Lieut. Chas. E. B. Flagg, assistant surgeon, Fort DuChesne, Utah. The patient was a colored soldier 35 years of age, who used tobacco and alcohol to excess, and had subjected himself to many exposures and privations while under the influence of the latter. He was admitted to hospital October 11, 1896, with bronchitic symptoms on which supervened an asthmatic condition which was not relieved by any of the usual remedies. A lobular pneumonia became developed during the continuance of the asthmatic symptoms and he died December 19. The following is from the report of the post-mortem examination:

The cerebral arteries do not appear sclerosed and the pia is transparent. The pericardium contains 75 c. c. of liquid. The heart is not enlarged and the valves are competent. The left side is empty and the right distended with blood. Blood clots extend along the pulmonary vessels. The right lung is bound on all sides by pleuritic adhesions and weighs 1,970 grams; 52 c. c. of fluid is in the pleural cavity. The left lung is bound by adhesions at the apex and has three lobes. At the base there are several small areas of consolidation, sinking when put in water. There are areas of moderate emphysema in both lungs and an abundant muco-purulent fluid issues from the bronchial tubes on section of any portion of either lung; a bloody serum is also freely discharged. There is no sign of previous tuberculosis. The bronchial lymph nodes are enlarged and dark colored. The liver weighs two kilos and appears normal. The spleen, pancreas, kidneys, suprarenal capsules, stomach, and intestines are normal. Along the aorta are two aneurisms, one, 2 cm. below the origin of the left subclavian, 10 cm. long, is cylindrical and, extending backward, has eroded the bodies of the fourth, fifth, and sixth dorsal vertebræ from about one-third to one-half of their thickness. Before incising the aorta this aneurism appeared simply as a slight dilatation. One and one-half cm. above this, at the posterior inferior aspect of the transverse portion of the arch, is a hemispherical aneurism 2 cm. in diameter, its opening into the aorta also measuring 2 cm.

The conformation of these aneurisms undoubtedly accounts for the absence of bruit, as, had this been present, it would have been heard during the frequent thorough examinations of the chest made from time to time. In the last weeks of life the patient held his chest in a fixed position. He complained of no pain at any time.

An interesting case of complete recovery from pleuritic empyema after operative interference was reported from Fort Sam Houston, Tex., by Maj. A. A. DeLoffre, surgeon.

Private P. H., Troop B, Second Cavalry; age, 45; was admitted to the hospital January 21, 1897; diagnosis, pleurisy with effusion, left side.

February 15.—For some days patient had been coughing up foul-smelling matter, and had been aspirated twice; amount of pus withdrawn, 1½ liters the first time and 1 liter the second time, about three days after the first. As this treatment afforded only temporary relief, and the patient seemed to be losing strength rapidly, it was decided to establish drainage of the cavity, and accordingly 4 cm. of the seventh rib were removed. The operation occupied about twenty minutes; chloroform was used on account of its being less irritating to the bronchial tubes than ether. On the section of bone being removed, an exploration with the finger revealed the fact that the lung was compressed to about half of its size; about 600 c. c. of putrid pus escaped from the cavity, which was thoroughly washed out with 1-2000 corrosive-sublimate solution, then with warm saturated solution of boric acid, and finally with normal salt solution.

The patient stood the operation badly on account of his want of breathing capacity, and frequent injections of brandy and ether had to be given. After the anæsthetic was withdrawn the patient reacted well and expressed himself as feeling quite comfortable. For the first few days he was dressed several times a day and the cavity drained each time the dressings were removed. The method employed to drain the chest was to raise him up on his shoulders, by the lower limbs, at an angle of about 40°, then to bring him into nearly a sitting posture, inclined to the left, finally ending by the first motion. The amount of pus drawn off during the twenty-four hours amounted to about 300 c. c. No attempt at irrigation was made except during the four or five days from February 26 to March 1, and the object of these was to dilute the pus, which had become so thick as to flow with difficulty through the fistula. These irrigations produced distressing cough, however, and had to be abandoned.

April 12.—For several days past there had been no discharge and the fistula was found to be completely closed; patient had gained about 25 pounds in weight; the

lung had expanded and there seemed to be good respiratory murmur over the affected side.

June 1.—His company commander writes me that Pvt. H. has improved very much in health, that he can ride horseback for half a day or more without fatigue, and that in his opinion he is entirely recovered. He was returned to duty at his own request June 15.

I am not familiar with cases of this nature, but it seems to me sufficiently interesting to report. After the man had reacted from the operation, I felt confident that his life would be spared, but I had no expectation of his retaining his usefulness as a soldier. It is said that these cases result as a rule more favorably when irrigations are omitted, and so far as my observation goes in this instance the statement is correct. In conclusion I will say that the after treatment was peculiarly trying, demanding the exercise of much skill and patience, and a great deal of credit for the favorable termination of the case is due to the intelligence and zeal of the steward and nurses who had it in charge.

The following case of abscess of the liver treated at the Army and Navy General Hospital, Hot Springs, Ark., and reported by Lieut. C. C. McCulloch, jr., assistant surgeon, presents several points of interest besides the great size of the abscess cavity.

Private A. R., Troop E, Seventh Cavalry, was admitted to the Army and Navy General Hospital from Fort Grant, Ariz., January 24, 1897. The following history accompanied him, sent by Surg. E. F. Gardner, United States Army:

"Private A. R. was admitted to hospital October 27, 1896, with remittent malarial fever. He had not been well for two weeks before he presented himself for treatment, but had hoped to overcome his trouble without going on sick report. He was in the bakery as post baker, and had been for several months. His condition was anæmic, with considerable loss of strength and loss of appetite. He had had no decided chill, but had several after his admission. These were controlled by quinine, and shortly after he was put on arsenic. His temperature chart shows the character and extent of the fever. Antipyretics were tried, but were of no use. About a month, or perhaps more, ago he complained of pain in his right side, and shortly after the liver was found to be much enlarged, but smooth in outline; the spleen also was enlarged. He had some difficulty in sleeping, and this was found to be best relieved by hypodermics of morphine, 0.008 at bedtime. General tonic treatment and milk diet, with such additions as he could take, were given. As it did not seem necessary, the quinine was stopped when he appeared to be convalescent and while negotiations for his furlough were in progress. As a result he had one or two chills a day or so before leaving for the Springs. They were controlled by quinine."

The diagnosis on the transfer slip accompanying the patient was: "Convalescent from malarial remittent fever, with enlargement of liver and spleen."

On the day following his admission to the Army and Navy General Hospital he was carefully examined, with the following result:

History, given by patient: Age, 36 years. Born in Germany; of German parentage. Father and mother died of old age. No known inherited tendencies to disease. Had the ordinary diseases of childhood, but no other disease prior to enlisting in the Army. First enlistment in 1881 in Fifth Cavalry; second enlistment in 1886, third in 1891, and fourth in 1897, all in Seventh Cavalry. Previous to present illness had no serious illness while serving in the Army.

History of present disease: Commenced in October, 1896. For about a week before going on sick report had general malaise and muscular pain in the right hypochondriac region. While in hospital at Fort Grant, Ariz., had pain localized in right side, which has continued without cessation. The side has gradually swollen to a considerable size, and he has had fever, but few chills. Usual weight, 178 pounds; present weight, 130 pounds. In October he had some trouble with his stomach, vomiting, and slight diarrhea. He also noticed that he occasionally passed blood with his stools. Says he never had any marked sweating following his chills, but that his skin was warm and he had some fever. Denies venereal infection. Admits more or less regular use of beer, but says he never indulged in that beverage to excess, nor used any other alcoholic liquors.

Present condition: Examined by Surg. H. O. Perley and Asst. Surg. C. C. McCulloch, jr., United States Army. A thin, emaciated man of good ordinary development. Skin yellowish in color; darker over abdomen; harsh and rough to the touch. Mucous membranes pale and anæmic. Complete anorexia; no vomiting; slight diarrhea; three or four loose movements from bowels daily, of light color. Tongue resembles raw beef in color and appearance. Glandular system normal; nervous system weak, but normal; heart normal, but weak; lungs normal. Has slight irritative cough; breath has a peculiar sweetish odor; respiration 24 per minute. Spleen slightly enlarged; genito-urinary system normal. Urine, January 27, 600 c. c.; specific gravity, 1,020;

acid; dark yellow in color; slightly cloudy and of strong odor; urea diminished; urates in excess; chlorides and phosphates normal; albumen, sugar, pus, blood, and bile absent.

An examination of the liver and abdomen shows that the skin over the abdomen is yellowish in color; it is very tense, as if stretched; the deposit of fat ordinarily found in this locality is wanting, and the superficial veins are very much enlarged and prominent; the liver extends downward almost to the crest of the ilium and beyond the middle line. The tumor is firm and resistant, and no fluctuation can be detected by the touch. The abdomen is very much retracted. Temperature, 101° F.; pulse, 120, very feeble. See opposite page.

A microscopic examination of the blood shows leucocytosis to a marked degree and large mononeuclear white blood corpuscles in excess; otherwise the characteristics of ordinary anæmic blood are found. The percentage of hæmoglobin is low. No malarial organism is discovered in the blood after careful examinations at different times with one-twelfth O. I. lens (Bausch and Lomb).

The diagnosis reached at this time was chronic septicæmia, due to poison absorbed from the liver. Without aspiration it was impossible to determine whether the hepatic tumor was an abscess or cancer. Owing to the extremely low condition of the patient and the exhaustion induced by his long journey, it was deemed inadvisable to resort to any operative procedure that day.

On the day following (January 26) it was decided that the patient, although extremely weak, had rallied sufficiently to admit of the operation of aspiration. The liver tumor was therefore aspirated with a fine needle in its central and most prominent point. On reaching a depth of about 3 inches a thick, heavy fluid of greenish color began to flow off, and did not cease until 400 c. c. had been obtained. This fluid was carefully examined microscopically and found to consist of broken-down liver and pus cells. The tumor did not apparently diminish in size. Close examination at this time and subsequently failed to demonstrate the presence of the amœba coli in the pus or stools.

The final diagnosis arrived at, therefore, was abscess of the liver.

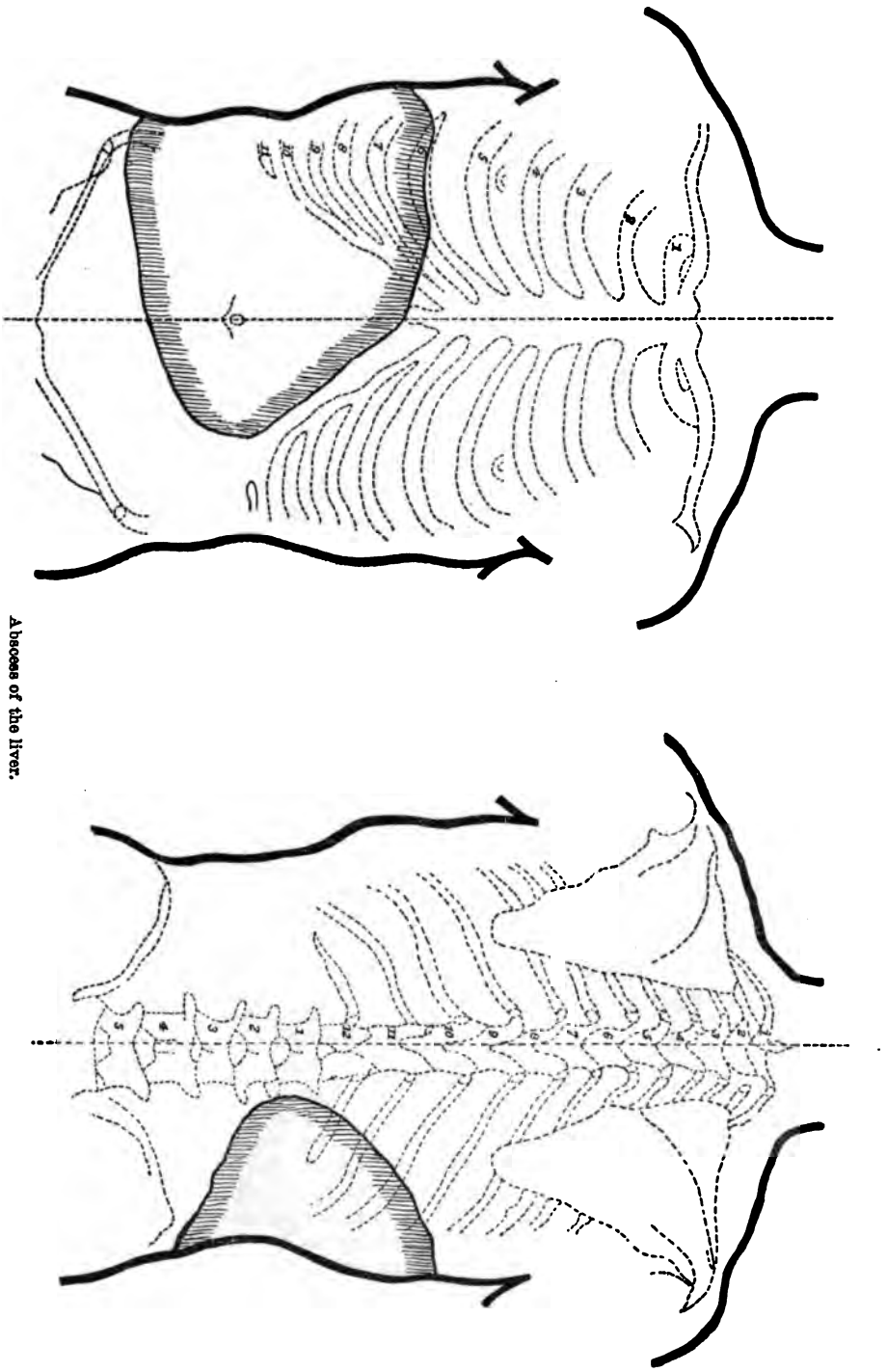
It was decided to attempt to stimulate and nourish the patient in every way possible, in order to place him in such condition as would justify a radical operation under general anæsthesia. On February 1, the patient not being strong enough to endure a satisfactory cutting operation, a large trocar and cannula were passed through the abdominal wall and pushed into the abscess cavity in the lower part of the right lobe; 4,096 c. c. (or 8 pints) of pus, by actual measurement, were drawn off. Microscopical examination showed no change in the character of the pus. The lower line of the liver now retracted beneath the lower ribs and the tumor entirely disappeared from sight.

In the medical literature in this hospital there is mentioned only one case of liver abscess in which the contents were more than this one. This is the case noted in Ziemssen's Cyclopedia, Volume IX, page 116, in which Rouis reports an abscess of 4,300 grams capacity.

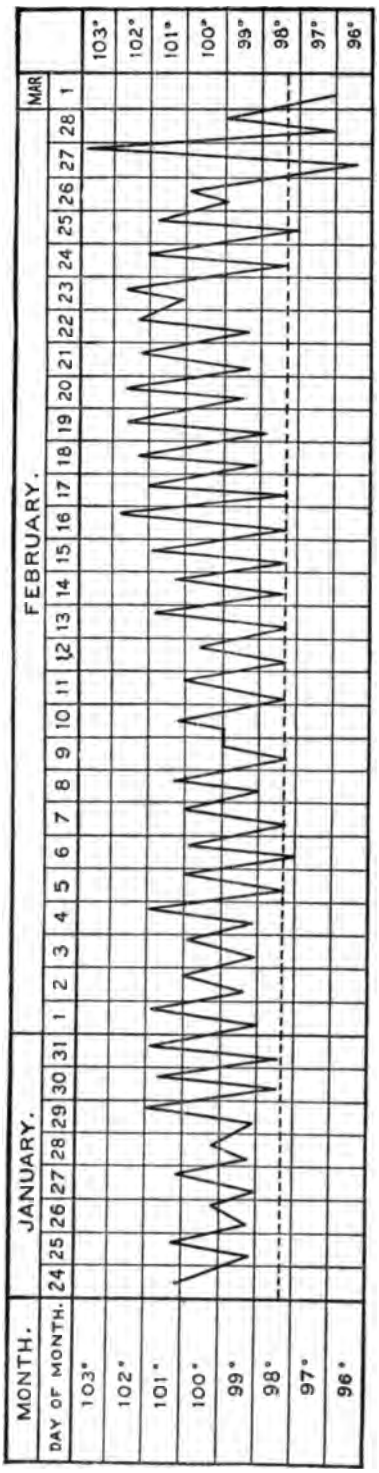
The patient at no time subsequently was considered in a condition to withstand the shock of a protracted operation. The septic fever continued without cessation, ranging about 102° F. in the evening and about 99° F. in the morning. No chills nor sweating until near the end; pulse 100 to 120 and very feeble; no pain after the operation; no jaundice except a slight yellowish tinge of the skin; progressive emaciation; respiration about 25 to 30 per minute; three or four loose movements from the bowels daily; consciousness preserved until shortly before death.

The general treatment was stimulant and nutritive. Liquid diet of soups, milk, eggs, and beef juice; tartrate of iron and potash 0.100 and tincture of nux vomica 1 c. c. three times a day with sherry wine 240 c. c. daily, and occasionally eggnogs, hypodermics of morphine 0.008 to 0.032. Locally the abscess cavity (the entire right lobe of the liver apparently being nothing but an elastic sack) was washed out three times daily with 2 liters of Thiersch's solution; borosalicylic acid and 120 c. c. of peroxide of hydrogen were injected daily and washed out by the Thiersch solution. Later, in addition to the Thiersch solution, bichloride of mercury 1 to 4,000, followed by boiled water, was injected daily. The cavity was washed until the solutions used returned each time perfectly clear. It gradually diminished in size from something over a capacity of 4 liters to one of 1 liter at the time of the patient's death; but the septicæmic condition was so thoroughly established that no measure was of any avail, and the patient gradually declined in strength and died March 1, 1897, at 6.50 p. m. For thermograph see page 120.

An autopsy was held on the succeeding day, with the following result: Weight of body, approximately, 100 pounds; exceedingly emaciated. Skin free from marks or spots. Of the internal organs those of the thoracic and abdominal cavities were alone examined. Lungs compressed, otherwise normal. Heart: Weight, 11¼ ounces; ventricular walls hypertrophied, semilunar valve degenerated; in left ventricle large clot; fatty infiltration of cardiac walls. Liver enormously enlarged, the right lobe



Abscess of the liver.



entirely replaced by a single large abscess cavity; no other abscess in the liver and no pyæmic abscess elsewhere. Spleen slightly enlarged, otherwise normal. Kidneys normal.

The abscess wall was adherent to the abdominal wall for several centimeters around the lower opening. The wall of the abscess cavity consisted of dense pyogenic membrane, containing shreds of broken-down purulent tissue and thick greenish pus. No other points of interest were developed by the autopsy.

Capt. Charles F. Mason, assistant surgeon, West Point, N. Y., reported an unusual case of fracture of the clavicle by muscular strain.

Private Young, of my detachment, is a strongly built, muscular young man of 24 years. He is in good health, and has never had a fracture before, except one of the nasal bones, from direct violence. On the evening of August 4, 1896, he took a child of 7 years, weighing 60 pounds, and with his left hand lifted him vertically above his head. While lowering the arm to the horizontal position the child made an unexpected motion and the arm suddenly gave way. There was loss of power in the arm and a swelling at the seat of fracture, but Private Young did not know that there was a fracture, and continued to perform his duty with his other arm until I saw him next day. On examination I found an oblique fracture near the junction of the middle and inner thirds of the bone, with displacement upward of the inner fragment and downward and inward of the outer fragment; also much swelling. Reduction was easy, although maintenance of the proper position was difficult. Union, however, was prompt and the result satisfactory.

My opinion is that the bone was broken by cross strain, the deltoid, in the vertical position of the arm, acting with the trapezius from above opposed by the pectoralis major from below.

Three cases of fracture of both bones of the leg treated by plaster of paris dressing were reported by Lieut. J. H. Stone, assistant surgeon, Fort Riley, Kans., as showing the advantage of this method of treatment over that by confinement to bed and the fracture box. It insures immediate and continued comfort to the patient by perfect apposition and immobilization of the fragments, and enables him to have moderate exercise and the advantage of outdoor life during the progress of repair.

CASE 1.—While practicing hurdle jumping, November 25, 1896, preparatory for field-day exercises, Private Grabow, Troop C, Second Cavalry, sustained simple frac-

ture of both bones of his left leg, about 3 inches above the malleoli, by his horse falling with him. Temporary splints were adjusted and morphin administered hypodermatically, to insure relief from pain during transportation to hospital.

The leg was washed and bathed in equal parts of alcohol and water. Extension and counter extension were made, and the ends of both bones placed in neat apposition. The permanent apparatus (plaster of paris cast) was then applied over a thick envelope of cotton batting. After this had set, the limb was slightly elevated. Compound aloin pills at bedtime to regulate the bowels, an iron tonic to be taken after meals, and full diet were prescribed. The patient got almost immediate relief and rested easy until 12.30 a. m. that night, when swelling at the point of fracture compelled the cast to be cut down the front. A retention bandage was then applied over the cast, which the patient wore continuously for one week. It was then removed, the leg examined and washed, and a Bavarian splint (plaster) applied. This was worn for four weeks, and the patient was up and about during this whole period. At the expiration of this time the bones were found to be well united (osseous union). There was neither deformity, shortening, nor other inconvenience, and since then the patient has walked without crutches. He was sent to quarters January 4 and to duty February 18, 1897.

CASE 2.—While practicing hurdle jumping, on November 24, 1896, preparatory for field exercises, Private Tyler, Troop K, First Cavalry, sustained simple fracture of both bones of the right leg, about 4 inches above the malleoli, by his horse falling with him. Dr. Heyl, captain and assistant surgeon, cared for the injured man, and having set the fractures, placed the limb in a fracture box. The case was turned over to my charge December 10, when I applied the permanent apparatus, and thus permitted the patient to be up and about and get the advantages thus afforded. The plaster cast was removed from time to time and the limb carefully examined. Bony union having taken place, the patient was sent to quarters February 4, and returned to duty March 18, 1897.

CASE 3.—Private Rowland, Troop A, Second Cavalry, sustained fracture of both bones of right leg, about 4 inches above the malleoli, by his horse falling with him while returning from field-day exercises, December 16, 1896. There was considerable contusion about the point of fracture, and the fragments were much displaced, although the fracture was a simple one. As in other cases, a plaster of paris cast was applied after the fragments had been placed in apposition. This cast had to be removed on the tenth day because of a musty odor, which proved to be due to a patch of dead skin, 1¼ inches in diameter, which had been elevated by a subcutaneous hemorrhage at the point of fracture. Another cast was put on, and a window made over the ulcer, to allow of proper antiseptic dressings. The ulcer healed rapidly. The cast was cut down in front and temporarily removed at stated intervals to permit of observation and cleansing. The patient wore the cast and was able to be up and around the ward until the bones had united. He was sent to quarters February 24. His present condition, March 19, is very good. There is no deformity, and he is able to bear weight on the leg.

Lieut. Ed. L. Munson, assistant surgeon, Fort Assinniboine, Mont., in a letter to this office dated June 15 last, invited attention to the cavalry carbine boot or case as a most satisfactory first-aid splint, especially in fractures below the knee. The two straps used for attaching the boot to the saddle can be used for binding the boot to the injured limb. They are easily applied, fixed in position, and being broad, are comfortable for the patient. Through the kindness of Lieut. Frank H. Albright, Twenty-fifth Infantry, the following illustrations were obtained:

"A" shows a suppositious fracture of one or both bones of the leg treated by the application of a single carbine boot. This boot is held in position by its two sling straps, the longer one passing twice around the splint and thigh, while the shorter one encircles the splint and leg below the knee. A triangular bandage binds the lower part of the splint to the ankle, while two other bandages fasten the knees and ankles together, and thus utilize the sound limb as an accessory splint. The two sling straps are always freed before applying the splint, and are passed loosely through the iron ring and the leather loop, thus preventing any displacement. The straps in all instances are so adjusted that, when snugly fastened, the buckles press against the boot rather than against the limb of the patient.

"B" shows the treatment of Potts' fracture by the use of two carbine boots and three of the four sling straps attached thereto, no triangular bandage being necessary. In this the broad part of the boot is placed at the foot, one boot on each side, and, the straps having been freed, a short strap is passed through the outside loop on each boot and buckled tightly. The second short strap passes around the leg

through the iron ring on each boot, and is buckled in position, coming at about the junction of the upper and middle thirds. A third and long strap encircles both boots and the limb well above the knee and is buckled in place, binding the whole compactly. If it be deemed necessary to steady the foot, a triangular bandage may be passed under the sole and fastened to the lower strap immediately above the loops. This splint is very solid and comfortable, and is of course adapted to the treatment of fractures of the leg bones higher up, as well as injury in or near the ankle joint.

"C" illustrates fracture of the thigh treated with two carbine boots, the four sling straps pertaining thereto and an additional triangular bandage. The straps having been freed, the external splint is placed so that the boot extends from about 4 inches below the axilla to the junction of the upper and middle thirds of the leg. The inner splint extends, the broad part uppermost, from the perineum to the ankle joint. A long strap is passed through the outer loop of the external boot around the waist and buckled securely. A short strap is passed through the external loop of the inner splint and around the thigh, passing through the iron ring of the external splint and including it. This strap passes about 3 inches below the trochanter. A third short strap is passed through the iron ring on the inner boot and encircles the limb and both splints immediately above the knee. The fourth strap binds the inner splint at the ankle joint, passing around twice, and the dressing is completed by tying the ankles together with a triangular bandage. The position of these straps can of course be changed to suit the nature of the injury, but it is well to utilize the loops and rings wherever possible. If deemed necessary, the external splint may be stiffened by inserting a stick or scabbard into the boot before adjusting.

"D" shows the treatment of Colles' fracture by the use of one carbine boot, its two sling straps, and two triangular bandages. This same dressing is also suitable to fractures of the humerus, or one or both bones of the forearm. It is not practicable to put up the hand midway between pronation and supination, but as this splint is only temporary, answers its main purpose well, and is very comfortable, it would seem as if this defect were unimportant. In its application the sling straps are freed and the boot placed with the broad end at the shoulder. A long strap is passed through the external loop and, continuing around the chest, is buckled snugly thus steadying the shoulder of the injured limb. A triangular bandage is slipped into the axilla and passed twice around the humerus and splint, going under the long strap and above the loop, to prevent its displacement downwards. The boot is now forcibly bent at right angles, so that the angle corresponds with the tip of the elbow, the patient or an assistant supporting the lower end and the wrist of the injured limb. The short strap is then passed through the iron ring over the humerus, turned at right angles to include the forearm, brought back in the form of the figure 8, and buckled. The dressing is completed by knotting a triangular bandage firmly around the splint and wrist and continuing the two free ends around the neck, where they are fastened, to form a sling.

Five cases of injury by the small-caliber bullet were reported specially. In one a bullet passed through the radio-carpal articulation. This case was reported by Maj. L. Brechemin, surgeon, Fort Sherman, Idaho:

While walking guard on the night of January 5, 1897, Private O. L., Company C, Sixteenth Infantry, had occasion to load his rifle for the purpose of giving an alarm of fire. He found that this alarm was not necessary, but he forgot to remove the cartridge, so that next morning, just before being relieved from guard, his rifle was accidentally discharged and he received a severe gunshot wound of the right forearm and wrist. The wound of entrance was at the ulnar side of front of right forearm, 2 inches from the wrist. The wound of exit was at the radial side of back of right forearm, through radio-carpal joint. The distance between the entrance and exit was 3½ inches. An escape of synovial fluid was noticed at the time of the injury, and shattering of the lower end of the radius was easily recognized. A rather profuse hemorrhage, probably from the interosseous artery, was controlled with some difficulty. The wound was treated by aseptic occlusion, the most careful attention being given to secure absolute surgical cleanliness. Complete solid union, without the appearance of pus at any time, was obtained in six weeks, and then the restoration of movements of the joint was attempted by passive motion. On April 27, 1897, he was returned to duty, cure incomplete; but as it was found that the remaining partial anchylosis of the wrist prevented a full performance of the manual of arms, especially the bayonet exercises, he was readmitted to hospital on April 29. On June 4 he was discharged on surgeon's certificate of disability for partial anchylosis of right wrist, resulting from gunshot wound, and for valvular disease of the heart (mitral regurgitation). The last disability probably resulted from an attack of rheumatism at Fort Pembina, N. Dak., in the fall of 1892, while serving as private Company A, Twenty-second Infantry.

"A."

"B."

In the anterior wall of the chest is a rough, jagged opening 2 by 1½ inches, including fifth rib, and formed by carrying away the cartilage of the fifth rib. The pectoralis major is infiltrated with blood in an area of 5 inches around this opening. In the upper anterior third of the heart is a large, open, rough lacerated wound, exposing the right ventricle, which has apparently burst open. The left chest contains a quart of blood clots and fluid. The entire right lung is bound down by adhesions. There is a lacerated opening through left lung 2 inches in diameter in upper lobe near its base and cutting across the left bronchial tube. On posterior wall of chest, 2½ inches to the left of the median line, is a lacerated opening 1½ inches in diameter, formed by a comminuted fracture of the fifth rib 1 inch to the left of its head. Around the wound of exit an area of 2 inches is infiltrated with blood. There is no evidence of disease except a foul catarrh of the stomach. The wound was received evidently at close range, though there are no powder stains.

A case of gunshot fracture of the spine by a revolver bullet, caliber .38, was reported by Maj. L. M. Maus, surgeon, Fort Sam Houston, Tex. A soldier of Troop F, Fifth Cavalry, was accidently shot by a comrade while in the squad room, October 28, 1896. The ball entered at the vertebral border of the right scapula, passed under the muscles of the back, and through the spinal canal between the sixth and seventh ribs, dividing the cord in its passage. It then entered the left pleural cavity, grazing the surface of the lung, and escaped by breaking through the sixth rib about 4 inches from its vertebral articulation. Sensation and motion were lost, as well as all reflexes, below the point of injury. An incision 6 inches long was made in the median line, crossing the apparent track of the bullet, but dissection revealed no fracture, and further examination was discontinued. The patient was made as comfortable as possible. The urine, which was more or less ammoniacal, was drawn regularly and the bladder irrigated with boracic solution. At first there was constipation, but afterwards involuntary stools were passed. The patient's mind remained clear, and he was hopeful until within a few days of his death. He became much emaciated, particularly below the point of injury, and bed sores were developed on all parts subject to pressure, although he had been put on a water bed shortly after the shooting. Twenty-four hours before death he became slightly delirious and finally lapsed into unconsciousness, from which he never recovered. He died twenty-six days after the receipt of the injury.

Two cases of fracture of the cervical spine were reported, one by Capt. W. C. Borden, assistant surgeon, Fort Snelling, Minn., the other by Maj. A. C. Girard, surgeon, Fort Douglas, Utah. In Dr. Borden's case the body of the fifth cervical vertebra was fractured and displaced, crushing the cord between it and the arch of the vertebra below. Operative interference failed to discover the condition of the injured parts. The patient died twenty hours after the injury. In Dr. Girard's case there was separation of the articular processes of the fourth and fifth vertebræ, with fracture through the base of one of the processes. Death took place at the end of thirty-six hours.

Dr. Borden's case.—Wagoner J. S., Company C, Third Infantry, age 37 years, when about to seat himself on a wagon loaded with sacks of flour slipped and fell backward, head downward, from the wagon, striking on his head, the entire weight of his body crushing down upon and forcibly flexing and fracturing the cervical portion of the spine.

The accident occurred at half past 1 o'clock on the afternoon of February 23, 1897. He was immediately brought to the hospital, where he was seen by the post surgeon, Maj. C. B. Byrne, Capt. H. A. Shaw, assistant surgeon, and myself. His mind was clear, articulation distinct, pupils normal, and there was no facial or lingual paralysis. Temperature was normal; respiration diaphragmatic; priapism was present; knee jerk and ankle clonus were completely abolished. The cremasteric reflex was indefinite, the right cremaster muscle contracting when the scrotum was lifted, but not responding to the usual stimuli. There was complete paralysis and anæsthesia of the lower extremities and body as high as the shoulders, and partial paralysis and loss of sensation in the upper extremities. The paralysis, the location of the anæs-

thetic areas of the upper extremities, and the position of the patient were indicative of a lesion of the cervical cord below the fifth nerve. The upper arms were slightly abducted, the forearms quite strongly flexed and supinated, and the fingers strongly flexed. From the paralysis of the opposing muscles and tonic contraction of the controlling muscles, any passive change of the upper extremity was resisted, and when force so applied was removed the parts immediately returned to the position just described. Sensation was limited in the hand to the radial distribution, and in the palm to the median distribution to the thumb, index, and one-half of the middle finger. From this it was argued that the fifth cervical nerve was uninjured, that the function of the seventh nerve was completely suspended or destroyed, while the condition of the sixth was uncertain. A diagnosis was, therefore, made of a fracture of the fifth or sixth cervical vertebra, with probable destruction of the cord at that level, or, if possible, though not probable, suspension of its function from local pressure.

In view of the extreme gravity of the injury, operation was advised as a forlorn hope that if the extensive paralysis and anæsthesia were even partially due to pressure or irritation from fragments of bone, and not to complete destruction of the cord, the removal of the pressure or bone fragments might give relief and allow regeneration of the cord. The patient readily consented to operation, and I operated two hours after the receipt of the injury, assisted by Major Byrne and Captain Shaw. Ether was used as an anæsthetic, and was given by Hospital Steward Vennemann. The usual aseptic precautions were taken. The patient was placed in the Sims' position, with a roll beneath the chest, his head turned nearly face downward, being held by an attendant. This position, while necessitated by the location of the injury, was extremely unfavorable for the patient, owing to his decreased respiratory power, and, though great care was used, the anæsthetic had to be twice suspended during the operation, and once artificial respiration had to be resorted to and hypodermics of strychnin administered.

A median incision was made extending from the second cervical to the second dorsal spine, and carried down until the spines were exposed. The muscles were then separated laterally from the spines and laminæ, when the laminæ of the fifth cervical were found fractured completely through on both sides close to the articular processes. The fractured part, comprising the entire posterior part of the arch, was liberated and removed, exposing the cord with its membranes. Both appeared normal. A small incision was made through the dura, but there was no subdural hemorrhage or clot. Venous hemorrhage was considerable during the operation, being particularly troublesome from the posterior and lateral longitudinal spinal veins, which were necessarily wounded in removing the posterior part of the arch, but was controlled by compresses wrung out of hot, sterile, normal salt solution. As no spiculum of bone nor cord compression could be detected, a gauze drain was inserted down to the cord, the muscles were stitched to the interspinous ligaments by catgut sutures carried through from side to side, and the skin was sutured with horsehair. To support the head and secure as much immobility as possible, a jury mast was extemporized by attaching a padded board to the trunk by adhesive strips and bandages, and the head was fixed to the upper end of the board by adhesive strips reaching around the board and over the forehead. The patient was then placed in bed with hot-water bottles about him. He reacted well from the operation, and the priapism, which disappeared when the ether was administered, did not return. His temperature was 99.6° F., pulse 61, and respiration 21. He passed a fairly comfortable night, sleeping considerably, though at times mildly delirious in his sleep. As there was paralysis of the bladder, his urine was drawn every eight hours; his bowels moved involuntarily at 11 p. m. At about 3 a. m., left-sided paralysis of the tongue set in, which gradually increased, and at 8 a. m. he began to have difficulty in swallowing. In the morning his mind was clear and he was quite comfortable; his temperature 101.2°, pulse 83, and respiration 24. As he complained of discomfort from his position, the head of his mattress was raised slightly, but at 10 a. m. he died suddenly, apparently from heart and respiratory failure.

Autopsy (four hours after death).—The brain and spinal cord only were examined. The wound at the back of the neck had not begun to unite. There was no discernible lesion of the upper brain or medulla. The spinal column was removed entire as far down as the second dorsal vertebra, when it was found that the body of the fifth cervical had been fractured completely through and was displaced backward, catching and crushing the cord between it and the upper portion of the arch of the vertebra next below, completely destroying the cord at that level and lacerating the spinal dura anteriorly. From this laceration spinal substance was oozing. From this it was apparent that the weight of the body in falling had crushed down upon the head, causing extreme flexion of the cervical spine, crushing and displacing the body of the fifth cervical backward and through the ligaments, bringing so much strain to bear upon the arch of the fifth cervical that both laminæ were fractured close to the articular processes.

The result of the autopsy, in connection with the symptoms and operation, was

interesting and instructive. That no injury of the cord was observed at the operation was shown to be due to the fact that the laceration of the dura and the projection backward of the body of the fractured vertebra were hidden by the cord. The definite symptoms, pointing, as they did, to a lesion of the cord between the fifth and seventh nerves, were verified. The correctness of the opinion expressed by authorities, that where the reflexes are totally abolished the destruction of the cord is complete, was shown, as both conditions obtained.

Relative to the operation, authorities nearly unanimously hold that permanent total absence of the reflexes contraindicates operation. The term permanent presupposes time, an elapse of time sufficient to determine that the reflexes will not return, and involves a waiting which, to me, appears unjustifiable in many cases. Operations in cases of spinal fracture with injury of the cord should be done as soon after the receipt of injury as possible, if best results are to be obtained, for by early operation pressure upon the cord can be removed and the cord can be placed in condition most favorable to its repair. In this case, from lack of previous experience in such cases, I removed only the fractured arch of the fifth cervical, and desisted from removing more from the fact that I could discover no splinters of bone and no compression or injury of the cord. As the autopsy proved, however, all discernible injury was anterior, and therefore out of sight, while the point of compression and cord injury was between the lower part of the fractured fifth vertebra and the arch of the sixth, and relief could only have been obtained and compression relieved by making the operation more extensive and removing the arch of the sixth.

The lesson to myself was that the laminectomy should be thorough; that, having located the injury and determined the lowest uninjured nerve, a sufficient number of laminæ next below the exit of the uninjured nerve should be removed to insure complete removal of compression and irritation from the cord. This would necessitate the removal of at least three arches, while as many more should be removed as the case may demand.

Dr. Girard's case.—J. H., a retired sergeant of Company B, Twenty-fourth Infantry, was balancing himself on the railing of a cellarway at Salt Lake City, and fell 21 feet, striking on his head. He was for a short time unconscious, but soon recovered his senses, and was found to be paralyzed from the shoulder girdle down. He was removed to the post hospital at Fort Douglas as soon as an ambulance could be obtained. Face and tongue not paralyzed. Lack of sensation downward from a point corresponding with right shoulder joint and clavicle, then descending to left nipple and rising to left shoulder, and thence horizontally across to right shoulder. Unable to move any limb; passive motion of head painful. Urine, 500 c. c., was drawn by catheter; 6 wet cups applied to nape of neck; croton oil, 2 drops, in pill and an enema of turpentine and castor oil given to meet possible local hemorrhage in spine, if no other injury had occurred. He died at 8.30 a. m., June 21, 1897, thirty-six hours after the receipt of the injury.

Post-mortem at 2.30 p. m.—Only the cervical region of the spine was examined. There was a distinct separation of the capsular ligaments between the fourth and fifth cervical vertebræ, exposing to view the facets of both articular processes of the fifth vertebra for about 1 cm., and a fracture extending through the base of the left process, the process being movable. The cord at the seat of the injury was pulpified, and there was hemorrhage in the fissures below.

A case of suprapubic prostatectomy for prostatic hypertrophy and chronic cystitis was reported by Capt. W. C. Borden, assistant surgeon, Fort Snelling, Minn.:

Lieutenant A, age 40 years, was first seen by me March 13, 1896, at which time he complained of great vesical irritability, requiring him to get up five or six times during the night and almost hourly during the day, the urine coming only by jets in a small stream and with great effort. He had had trouble of this kind, although of less degree, for two or three years; but all the symptoms had been gradually increasing in severity until his condition had become almost unbearable. There was some feeling of tenderness on pressure over the perineum and hypogastric region, and the passage of fæces always forced urine from the bladder through the urethra. Precipitation of the urine by the centrifuge showed a large deposit which consisted of pus cells, exfoliated bladder epithelium, and bacteria. Cystitis, due to retention from stricture, was suspected, as there was a history of specific urethritis having occurred some twelve years before. The urethra was carefully examined, and found to be perfectly smooth as far as the prostatic portion, where obstruction was encountered.

In order to determine the exact nature of the obstruction, the patient was etherized and carefully examined by Asst. Surg. H. A. Shaw and myself. No narrowing of the urethra was found, instruments of normal caliber passing into the bladder when given the prostatic curve or when the handles were greatly depressed. By

rectal examination an enlargement of the prostate could be made out, which, however, did not seem to be great. As a result of the examination, moderate enlargement of the median lobe of the prostate, producing cystitis and vesical atony, was diagnosed. He was put on the usual treatment for such cases and the urine was drawn twice daily with a soft-rubber catheter immediately after urination. The amount of residual urine averaged about 5 ounces, the smallest quantity so obtained being 2 ounces and the largest 7. His condition improved somewhat, but, in spite of the greatest care which could be exercised as to cleanliness, he had two urethral chills, each followed by fever and increased vesical inflammation. This, together with mental irritability and depression, which had become pronounced, caused me to advise operative treatment, and, on September 13, 1896, I did suprapubic prostatectomy, assisted by Dr. De Witt, formerly assistant surgeon, U. S. A., and Dr. Heath, both of St. Paul, who acted as first and second assistants. The usual aseptic precautions were taken and the bladder was thoroughly washed out with boric-acid solution. The rectum was dilated with 8 ounces of water forced into a previously inserted rectal colpeurynter. The patient was then placed in the Trendelenburg position, the bladder dilated with 8 ounces of boric-acid solution. An incision about 2½ inches long was made in the median line just above the pubes and carried down to the bladder. The peritoneum was not seen. The bladder wall was secured by two long silk stitches and incised for 2 inches, when, with laterally placed retractors, an excellent view of its interior was obtained. The mucous membrane was red and inflamed, particularly at the base, and there was a bar-like, but not great, enlargement of the median lobe of the prostate. The mucous membrane covering the enlargement was cut through and the hypertrophied tissue was curetted out. Hemorrhage was slight. The opening of the bladder was stitched to the external opening by four stitches, two on either side, and the spaces in the cellular tissue between the bladder and skin were closely packed with iodoform gauze. A double drainage tube was inserted and fastened in by a silkworm gut stitch through the skin and a dressing of iodoform and plain gauze and absorbent cotton was applied over the wound and around the tube. The aftercourse was uneventful. The temperature, which on the day following the operation reached 101.2°, rapidly fell until it reached normal. The patient was quite obstinately constipated, requiring frequent cathartics and enemata, and suffered considerably from tormina and tenesmus, due probably to the close proximity of the wound in the prostate to the rectum. The dressings were changed daily and the bladder was washed out with boric acid solution, at first through the drainage tubes, but after the twelfth day by inserting a tube about 1 inch within the meatus, and so washing from before backward, the water escaping through the drainage tube. The iodoform-gauze packing about the wound was not removed until the fourth day, by which time the plastic exudate and adhesions had shut off the cellular tissue spaces, so preventing urinary infiltration. Urine first passed through the urethra on the twenty-sixth day; the drainage tube was finally removed on the thirty-fourth day, and the wound closed on the thirty-eighth. The urine passed after closure of the wound at first contained a considerable number of pus and epithelial cells. These rapidly decreased in number, and had almost disappeared on November 14, when the patient left the post on sick leave on my recommendation that he spend the winter in the south, where conditions were favorable to his recovery from the debility following the operation and his protracted convalescence. When he left, there was no cystic irritability; he urinated about once in four hours and not at all during the night. Catheterization was not required and had not been required since the operation.

In reporting this case the following points seem to me to be of interest: As hypertrophy of the prostate occurs chiefly in men past the age of 55, and but few cases under 50 have been reported, its occurrence in this case at 40 years of age is unusual and one of the earliest recorded. Mudd reports a case in a negro of only 27; White reports having seen two cases aged 42 and 44, and McGill operated on one at 53.

In this case the enlargement was of the bar form; and while not great, the amount of residual urine before the operation and the improved condition which has so far followed operative treatment is indicative of its value.

The low temperature range is noticeable, following as it did an operation which from its nature could not be entirely aseptic. I attribute the favorable course to the thorough washing out of the bladder, the careful aseptic precautions taken with the skin, instruments, etc., and particularly to the careful packing of the spaces between the bladder and abdominal wall with gauze, heavily impregnated with iodoform. When the bladder is incised and emptied, it contracts, and when the edges of the incision are fastened at four points by sutures to the external wound, the appearance is much like that of a small bag with a small mouth fastened within a larger bag with a larger mouth, the spaces between offering considerable surface for infection from and infiltration with urine. By carefully packing those spaces with iodoform gauze and leaving the gauze in as long as possible the surfaces of the spaces are closed by plastic exudate and adhesions, so presenting a granulating surface, which prevents septic absorption and urinary infiltration.

Besides the cases already submitted, page 96, and operations for appendicitis and the radical cure of hernia, there have been received reports of two cases in which the abdominal cavity was entered. In one Capt. J. L. Phillips, assistant surgeon, Fort Walla Walla, Wash., operated for a gunshot wound of the pelvis, and in the other Capt. E. B. Frick, assistant surgeon, Presidio of San Francisco, Cal., performed a successful nephrectomy in a case of pyelonephritis.

Gunshot wound of pelvis. J. M. S., private Troop H, Fourth United States Cavalry, was accidentally shot by a comrade while at target practice April 26, 1897, weapon .38-caliber, double-acting service revolver. When I first saw patient ten minutes after injury, he was lying on his back, face pale and bathed in cold perspiration, extremities cold, heart weak and rapid, and suffering intensely. An examination without disturbing him revealed a gunshot wound in the middle line over the symphysis pubis, about half an inch above base of penis. Patient was at once transferred to litter and brought to hospital, where he was carried to the operating room, his clothing removed, and placed on the operating table. An examination, in company with Dr. John E. Bingham, of Walla Walla, who was called in to see the case, revealed, in addition to wound of entrance described above, a wound of exit three-fourths of an inch to the left of the middle line just above the commencement of the cleft of buttocks. There was marked tenderness over the entire abdomen, with flatness on percussion over the lower part of the abdominal cavity. It was agreed that while the wound was in all probability mortal the only chance for life was in an operation. The patient willingly accepted this, and the usual caution as to surgical cleanliness being observed, ether was administered. With Dr. Bingham assisting, I made an incision in the middle line extending from the umbilicus to the symphysis pubis, and including in its lower part the wound of entrance. On opening the peritoneal cavity urine tinged with blood gushed out and a marked fæcal odor was noticeable. An examination of the intestinal canal to the sigmoid flexure failed to reveal more than a commencing peritonitis, plaques of lymph with congestion in some places so marked as to require careful examination to determine that there was no perforation. The course of the bullet was through the abdominal wall grooving the pubic bones, through the anterior wall of the bladder below the peritoneum, through posterior wall of bladder, nicking the recto-vesical fold of peritoneum in its most dependent portion, through rectum and sacrum to point of exit. The anterior bladder wound was carefully brought together with fine catgut (Lembert) sutures, the wound in the recto-vesical fold of the peritoneum was enlarged, and with much difficulty, on account of being hard to get at, the posterior bladder and anterior rectal wounds were brought together with the same material. The recto-vesical wound was then closed, the abdominal cavity flushed with warm Thiersch solution, mopped thoroughly dry with sterilized gauze pads, a strip of iodoform gauze brought out of the lower angle of the wound for drainage, and the abdominal wound closed. Dressings of gauze and absorbent cotton were applied, and the patient was put to bed surrounded with hot bottles. The contents of a first aid packet with addition of absorbent cotton were used to dress the wound of exit. On coming from under the anæsthetic the patient complained of great pain, peritonitic in character, and 0.016 of morphin was ordered hypodermically, to be repeated in two hours if necessary. The patient did not rally after the operation; pulmonary œdema commenced in the course of the afternoon, and death occurred at about 2 o'clock on the morning of the 27th, eighteen hours after the accident. No autopsy was made on account of the condition of my hands and the fact that the course of the bullet was clearly ascertained during the operation. A soft-rubber catheter was introduced twice during the afternoon and evening, drawing off possibly half an ounce of bloody urine each time.

Remarks.—It is worth while to state that the patient, though within 5 or 6 feet of the revolver when discharged, did not fall when struck, but leaned forward, exclaiming, "I am shot!" Then assumed the erect position, and did not lie down until urged to do so by the commissioned officer in charge of the practice. As to the operation, though the recto-vesical fold of the peritoneum was wounded, it was with the greatest difficulty after the wound in the peritoneum had been enlarged that the posterior vesical and anterior rectal wounds could be reached. Perhaps a less limited experience in the surgery of these parts would have suggested some better method than the one adopted, but the condition of the patient necessitated all dispatch, consistent with carefulness, in discontinuing the use of the ether.

Dr. Frick's case.—Nephrectomy. The patient, Mrs. R., I saw for the first time on December 29, 1896. She gave the following history: Age, 21; married seventeen months; never pregnant; had measles, mumps, and remittent and typhoid fevers in childhood; has had pain, at times very severe, in right lumbar region posteriorly, since the attack of fever, diagnosed as malarial remittent, when about 8 years old.

Four years ago she consulted a physician for the pain in her back and right side and was told that she had an abscess of the liver. About April, 1896, she first noticed that her urine was cloudy. On examination patient was found to be anæmic and emaciated; temperature, 99.4°; no history of chills. A mass was found in the right lumbar region, which was diagnosed to be a renal tumor. A sample of urine was found to contain large quantities of pus; examination for tubercle bacilli was made with negative result. A diagnosis of pyelonephritis was made, and operation advised.

The patient consented to the operation, was removed to a private hospital on January 4, and on the following morning I performed the operation of nephrectomy, assisted by Drs. J. H. Barbet and F. B. Carpenter. Dr. William Barbet gave the anæsthetic, chloroform being used. Lieut. Col. J. V. D. Middleton, chief surgeon of the department, was also present.

A vertical incision about 5 inches long was made in the abdominal wall through the right linea semilunaris and directly over the tumor. The anterior incision was selected on account of the large size of the tumor and the fact that the mass could be grasped through the abdominal parietes. The peritoneum covering the tumor was incised and an effort made to strip it off. This was found to be very difficult, as the layer of peritoneum investing the kidney was closely adherent to the capsule throughout. After much difficulty the organ was freed from adhesions, and a clamp was applied to the vessels, care being taken not to include the ureter. The vessels were then cut and separately ligated with chromicised catgut. The ureter was then dissected out for 5 or 6 inches and clamped; a chromicised catgut ligature was applied below the clamp and the ureter cut between, and its open end above the ligature was carefully wiped out with pure carbolic acid. The posterior layer of peritoneum was then sutured with fine catgut and the abdominal incision closed, the peritoneum, fascia, and skin being sutured in separate layers. The usual dressing of sterile gauze was applied and the patient taken from the operating room.

Recovery was without incident worthy of special mention. Pus continued to be present in the urine in small quantities from cystic inflammation for about two weeks. Patient was allowed to sit up on January 25, and on the 26th she was brought back to the post.

At the present time, February 25, she is absolutely free from pain and says she can not remember when she felt so well. She has gained in weight, has a good color, and is able to attend to her household duties. The urine is entirely free from pus. The kidney which was removed was found to have been almost entirely converted into a large pus sack. A calculus was impacted in the pelvis. I exhibited the specimen to the San Francisco County Medical Society at its regular January meeting, and subsequently forwarded it to the Army Medical Museum at Washington, D. C.

Seven special reports of operation in cases of appendicitis have been received. One of these ended fatally. It occurred in the service of Capt. W. H. Arthur, assistant surgeon, Fort Myer, Va.

G. B., private, Troop H, Sixth Cavalry, 26 years of age, of spare build, poorly nourished and anæmic, was admitted to hospital 8 a. m., June 11, 1897, complaining of severe general abdominal pain, not referred to any circumscribed locality, and unattended with tenderness on pressure or rise of temperature; pulse somewhat accelerated, but otherwise healthy. The pain disappeared under anodynes and hot applications. At 7 p. m. the temperature had risen to 103°; no pain was complained of, but there was considerable tenderness in the right iliac region, without swelling muscular rigidity, or dullness on percussion. No chill preceded this rise of temperature. During the next ten days he was kept under close observation. The temperature was slightly above the normal, but there was little pain or tenderness.

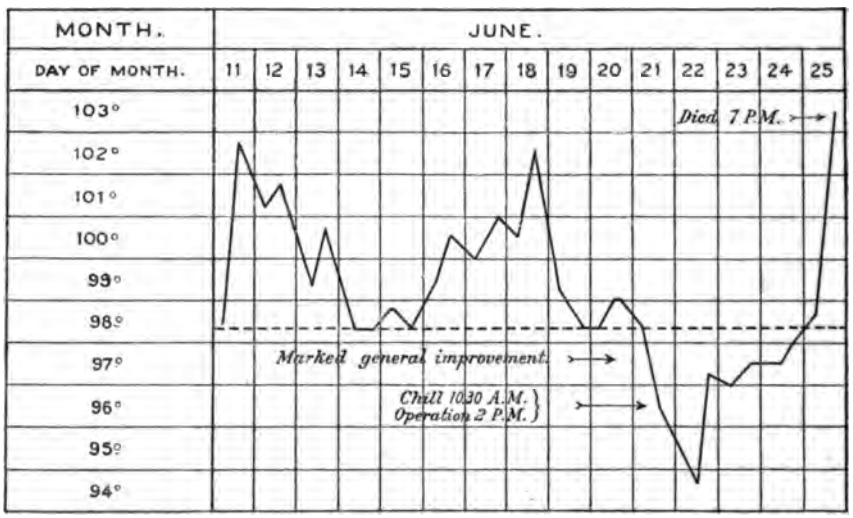
June 21, 9 a. m.—Temperature normal; general appearance bad; pulse rapid and weak; face anxious. At 10.30 a severe chill set in. Careful blood examination was made at once to exclude possibility of malarial complication; no malarial parasite was found. Preparations for operation were completed at once, and at 2 p. m. the operation was commenced, Capt. E. A. Mearns, assistant surgeon, assisting. The patient's condition at this time was bad, pulse weak, extremities cold, temperature subnormal.

The abdominal cavity was opened by ordinary incision. Evidences of former attacks of appendicitis were apparent at once in the old adhesions that bound cæcum and appendix firmly together, and both to iliac fossa and lateral abdominal wall. No sign of abscess in or near iliac fossa was found, but in trying to break up the adhesions of the cæcum and separate the appendix from it a large foul abscess was encountered behind the ascending colon, at a point about 2 inches above the crest of the ilium in the right axillary line, the point to which the patient had referred most of the tenderness. From this abscess gushed about 120 c. c. of very offensive pus and gas. At once a long glass tube was inserted and the cavity was flushed out with hot sterilized normal salt solution.

The condition of the patient was now very bad. It was thought at one time that he had actually died on the table, but hot rectal injections delivered high up, and hypodermic injections of strychnin and brandy revived him somewhat. Further search for the distal extremity of the gangrenous appendix was necessarily abandoned. The wound was lightly packed with iodoform gauze around a glass drainage tube and the patient put to bed, covered with blankets, surrounded with hot water bottles and given half a liter of an intravenous hot saline injection. As soon as he was able to swallow, hot milk and brandy were administered every hour. At 10 p. m. he was still in a state of partial collapse, temperature 95.6°; another half liter of intravenous injection of hot normal salt solution was administered with good effect.

June 22, 9 a. m.—General condition bad; temperature far below normal (94°); pulse very weak and rapid; restless; abdomen slightly tympanitic. Dressings removed and wound thoroughly irrigated. Toward afternoon general improvement noticed; temperature 97.6°; pulse stronger.

June 23.—Dressings, drainage tube, and packing removed, and wound thoroughly irrigated. The patient sank gradually from this time, with all the signs of a general septic peritonitis. He died at 7 p. m. of the 25th.



Post mortem (*three hours after death*).—Upon opening up the wound all the signs of advanced general peritonitis were apparent, with pus welling up in large quantities from the site of the abscess. The vermiform appendix was so firmly adherent to the cæcum that it was with difficulty separated by careful dissection. It was closely applied to the posterior wall of the ascending colon, and about 2½ inches from its origin had sloughed entirely through. The distal extremity was a friable gangrenous mass, so firmly adherent to surrounding parts that it could not be separated.

It is possible that this patient might have been saved if an early incision had been made directly down upon the abscess through the lumbar muscles and good drainage established there, instead of operating by the usual incision for appendicitis, for the entire trouble was caused by the sloughing of the appendix; and if the abscess had been freely opened and drained by an incision at the point indicated general peritoneal infection might have been avoided. On the other hand, these cases are so obscure and the reference of pain to any given locality in the abdomen is such an uncertain guide (and in this case it was the only guide) that it seemed safer to attack the disease of the appendix at a point where the whole organ could be brought into view.

It would, I think, have been good surgery to have made a counter opening in the back for the drainage of this abscess; but the patient's condition was so very bad at the time of the operation that any further procedure, even so small a one as the extra incision in the lumbar region, was hardly advisable. Still I regret that I did not establish drainage directly through the lumbar region, for the drainage through the wound of operation was not satisfactory. The firm old adhesions of the peritoneum in the iliac fossa made any extraperitoneal examination impossible, and it was at once apparent that the peritoneal cavity must be opened to find the appendix at all. The peritoneal infection had in all probability taken place during the forenoon of the day of the operation, and the chill occurring in the morning of that day was probably due to the breaking down of the limiting adhesions at some point and the

escape of septic matter into the abdominal cavity. This man had evidently suffered from repeated attacks of appendicitis in times past. He had been in the service only eighteen months. His history prior to enlistment could not be ascertained.

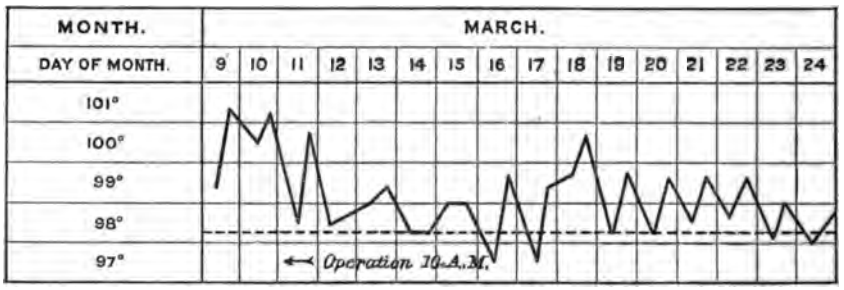
Of the six successful cases of operative interference in appendicitis, the first submitted below was by Capt. W. C. Borden, assistant surgeon, Fort Snelling, Minn. In it the appendix lay behind the cæcum, its distal extremity upward. The second case was by Lieut. A. N. Stark, assistant surgeon, Fort Sam Houston, Tex. In this case also the appendix was out of its usual situation. It was found beneath the anterior border of the liver, the cæcum having been dragged out of place by the adhesions of previous attacks. The chief surgeon of the department was present at this operation and indorsed on the report of the case his testimony to the skill of the operator. The third case was by Lieut. John S. Kulp, assistant surgeon, Vancouver Barracks, Wash. The fourth case occurred in the practice of Capt. W. P. Kendall, assistant surgeon, Fort Brown, Tex. The patient in the fifth case was a cadet at the Military Academy at West Point, the operator Maj. George H. Torney, surgeon. In the last case, which was by Maj. A. C. Girard, surgeon, Fort Douglas, Utah, the healing process after operation was complicated by local infection and the formation of a purulent collection of considerable size.

Dr. Borden's case.—Private Andrew Daley, Company B, Third Infantry, aged 25 years, was admitted to hospital on the morning of March 9, 1897. He had been troubled with constipation and abdominal uneasiness for several days and had obtained some pills from a comrade the evening before, which had moved his bowels once, the passage being followed by severe abdominal pain and vomiting, for which he had gone on sick report. His temperature on admission was 99.2° F.; in the evening it had risen to 101.4° F. Next morning I, with Capt. H. A. Shaw, assistant surgeon, was asked by the surgeon, Maj. C. B. Byrne, to see him as a probable case of appendicitis. At that time his temperature was 100.6°; pulse 82, small, tense, and wiry, and his respiration 18. He had a markedly anxious and drawn expression of countenance, the look being that so typical to an experienced observer of acute abdominal trouble. He was vomiting quite frequently, mostly a slimy fluid, greenish yellow in color and not stercoraceous. There was right-sided abdominal pain on pressure, most intense over McBurney's point, the area of greatest tenderness extending in a straight line upward from this point for about 3 inches. There was no tumor or dullness on percussion, nor was there marked muscular rigidity, the rigidity being only of the moderate involuntary kind produced by resistance to pressure over tender areas. The diagnosis of acute appendicitis was concurred in, and from the pulse, anxious countenance, constipation and vomiting, a suppurative form of marked gravity was feared. It was determined to attempt palliative measures, cathartics to move the bowels, etc., and to keep the case under close observation with a view to operative interference should no marked improvement be apparent before the next morning, or sooner should the symptoms demand it.

The next morning his temperature at 7 a. m. had dropped to 98.6° F.; pulse, 72. At 9 a. m. it had risen to 99.4°; pulse, 85. His general symptoms were all worse than the day before. The anxious expression of countenance was more marked, the pulse more wiry. There was still no dullness on abdominal percussion, but the tenderness was increased. The bowels were unmoved in spite of cathartics and enemas, and vomiting was occurring about every fifteen minutes and was of the character often present in appendicitis, in that there was no retching and in that it could be produced by pressure over McBurney's point. In view of these symptoms, an immediate operation was proposed and consented to, and I operated at 10 a. m., assisted by Assistant Surgeon Shaw. An oblique incision was made directly over McBurney's point, the line of incision being practically parallel to the outer edge of the rectus muscle, and search was made for the appendix and the inflammatory focus. The cæcum and peritoneum covering it were normal in appearance, and on following the white lines on its outer surface which converge at the appendix these were seen to meet and disappear under the head of the cæcum, where the latter was closely bound to the posterior abdominal wall by the mæsocæcum. Careful search was made for the appendix. It could not be found; but below the upper end of the incision on the posterior abdominal wall at the inner side of the colon the peritoneum was greatly congested, bulging, and fluctuating. In this inflamed area two constricting bands, formed partly of omentum and partly of adhesions connecting the omentum with the inflamed area, extended quite tightly across the colon

and occluded it. These bands of adhesions, which were fully one-half inch in width, were divided between ligatures, and the occluded colon became freed. The abdomen was then walled off from the fluctuating spot with gauze, forming a gauze crater, at the bottom of which was the abscess, which was then opened. About one-half ounce of dirty pus having a strong fæcal odor escaped and was carefully removed with sterile gauze sponges. On introducing a finger into the abscess cavity it was found to lead down beneath the cæcum. A rubber drainage tube was sewed into the abscess cavity with a silkworm gut stitch, and a drain of iodoform gauze was constructed about the drainage tube, after which the protecting gauze which was walling off the intestines was withdrawn. With the exception of the drain opening the peritoneum was sewed with heat-sterilized catgut. The fascia and muscles were sewed with large catgut, heat sterilized and boiled in bichlorided alcohol, 1 to 500, and the skin with silkworm gut, this being chosen on account of the tension which the skin might undergo from the presence of the drain. After this an aseptic dressing was applied. The patient rallied well from the operation. His bowels were moved for the first time on the evening of the day (thirty-six hours) after the operation. Previous to this time he vomited frequently, as before the operation, but after the first stool vomiting became less, and twelve hours later ceased altogether. On the second day, March 12, following the operation the urine became markedly increased, 75 ounces, and contained albumen, 25 per cent, casts, desquamated tube cells, and red blood cells. The quantity of urine remained markedly increased for twelve days, reaching as high as 93 ounces, but the albumen decreased rapidly, being 20 per cent on March 13th, 8 per cent on the 14th, 2 per cent on the 15th, a trace on the 16th, after which it gradually decreased and finally disappeared on the 24th. The casts, epithelium, and blood cells decreased pari passu with the albumen.

The dressings were changed on the second day and every day thereafter. The drain was removed on the fifth day. It was left in for this length of time as the condition of the patient was good and firm adhesions were desired about the drain to shut off and protect the general peritoneal cavity from infection. After removal of the drain the wound was irrigated twice daily with sterile water and a weak solution of hydrogen peroxide. At first there was a copious discharge of matter having an extremely offensive fæcal odor, but no formed or definite fæcal matter at any time appeared. The discharge and odor gradually grew less and ceased, and the wound closed completely twenty-one days after the operation. The patient left the hospital and was returned to duty nine weeks after his admission to sick report.



The case is interesting, and in some particulars peculiar. The operation, forty-eight hours after the onset of the attack, was fortunately timed. Had it been done sooner the small accumulation of pus would probably have been difficult to find; had it been a little delayed, the pus, which was already pointing, would certainly have escaped into the general peritoneal cavity, producing a general septic peritonitis and death. The occlusion of the ascending colon by bands of adhesion was unusual and accounts for the obstinate constipation and continued and distressing vomiting. Had operation been delayed, stercoraceous vomiting would undoubtedly soon have supervened.

From the failure to find the appendix after careful search, following the converging of the guiding lines below and beneath the cæcum, from the healthy condition of the peritoneum covering the cæcum, and the position of the abscess behind the cæcum and fully 4 inches above its lower attachment, I am convinced that the appendix was given off, and lay posterior to the cæcum, extra or subperitoneally as it is sometimes described, with its end upward, and that the inflammation and perforation occurred at the end, with a consequent location of the abscess at the point found. Finding and removing the appendix could have been accomplished only by a dissection upward behind the cæcum, producing an amount of traumatism and extension of infection not justifiable in a case where suppuration already existed.

The occurrence of the acute nephritis following the operation is of interest, as the question arises whether the nephritis was an other nephritis and present in both

kidneys, or a nephritis of the right kidney only, and due to the close proximity of the appendiceal abscess, which was close to the lower end of the kidney.

As regards the technique of the operation, carefully walling off the abdominal cavity with gauze before opening the abscess worked most admirably in preventing the diffusion of infection; and leaving the drain in until adhesion had formed completed the protection. By using sutures of catgut, made antiseptic and slowly absorbable by heat sterilization and boiling in bichlorided alcohol, union of the tissues went on synchronously with the absorption of the ligatures, while had non-absorbable ligatures, silkworm gut or silver wire been used, there would have been extension of infection to these and convalescence would have been delayed until they had been discharged from the wound.

Dr. Stark's case.—On November 19, 1896, I was summoned to see J. M., aged 15, who complained of intense general abdominal pain accompanied by nausea and a slight febrile movement. The patient stated that he had suffered from two previous attacks, and that after several days the acute symptoms had passed off, but had left him with slight constant pain, particularly on the right side. Physical examination disclosed nothing of importance; but the previous history led me to suspect that some indication of appendicular trouble would soon appear, and I therefore adopted expectant treatment.

On November 20 the symptoms had not changed, except that the pain seemed more acute over the region of the liver on the right side.

On November 21 the pain was very acute over the entire right side, the nausea and fever had increased, but physical examination failed to develop any indication of disease of the appendix. I determined to operate, and after consultation with my colleagues, on the evening of the same day I opened the abdominal cavity after the usual technique, but failed to find the appendix in any direction as far as the finger could reach. My assistants met with the same result. After repeated trials, the abdominal wall was incised inch by inch to the free border of the ribs, and there the appendix was found beneath the anterior border of the liver, bound tightly to the cæcum and omentum by dense bands, and far out of its usual situation, probably due to adhesions from the previous attacks having dragged the cæcum out of its bed. Both the cæcum and appendix were gangrenous; so after isolating and ligating the appendix, it was amputated and the stump well seared with the cautery, as the usual technique of inversion could not be followed. Though the manipulation necessary to return the cæcum and the stump to the abdominal cavity was very gentle, the cæcum became ruptured. The rent was closed by a set of Lembert sutures. The technique for the after treatment of gangrenous cases was followed, and though the patient was critically ill for several days, he responded happily to treatment, and on December 21, was out of bed and free from his usual pain.

Dr. Kulp's case.—Private H. D., Company D, Fourteenth Infantry, reported at surgeon's call December 8, 1896, complaining of severe abdominal pain. This increased in severity until by 2 p. m. there was nausea with vomiting, tenderness over McBurney's point, great pain, and a temperature of 102.2°, pointing to a probable streptococcic infection rather than one due to the less active colon bacillus.

The diagnosis being unmistakable, by the courtesy of Capt. R. G. Ebert I removed the appendix at 7.30 p. m. A vertical incision about 6 or 7 cm. long was made over McBurney's point. The appendix was found to be very much enlarged, weighing 5.9 grams, hard and firm, and with an oval slough 1 by 1.5 cm. opposite the attachment of the meso-appendix, and 1 cm. from the gut. The branch of the ileo-colic artery supplying the appendix was of normal caliber and could be plainly demonstrated. The brief duration of the case had given fibrinous adhesions no time to form, and the absence of odor confirmed the supposition that the condition was not due to the colon bacillus, but to streptococcic invasion. The case was a typical one of the form termed by Morris, "acute, infective, exudative appendicitis." The appendix was ligated with No. 4 catgut and excised, leaving 5 cm. beyond the ligature; and the stump, after being well rubbed with a tablet of mercury perchloride, was completely invaginated into the cæcum by means of three Lembert sutures. The peritoneum was then brought together with six sutures of fine catgut tied by threes, which procedure I have tried with several previous cases, and believe that it gives, with such delicate membranes, as perfect coaptation as the method of tying single stitches, not to speak of the saving in time. A second row of sutures was then placed well back in the cut margins of the transversalis fascia and aponeurosis of the three muscles and tied rather loosely. After this the skin was united as perfectly as possible by eight fine silk stitches, placed very near together, and the wound dressed in the usual manner.

The patient rallied well from the ether and was given salol, 0.324, and codein, 0.069, after which he slept restfully for seven hours. No opium was used, in order that the peritoneum might remain as active as possible, and no nourishment other than small amounts of peppermint water was allowed for the first twenty-four hours. At the end of a week the wound was dressed and was found to have healed by first intention. A few days later, the patient complaining of some tenderness, there was

found to be a small slough beneath the skin, caused, I believe, by the death of the portion of the external oblique included in the jaws of the artery forceps, which were used as retractors. Three stitches were used, on December 29, to again close the wound, after which the patient made a rapid recovery, leaving the hospital January 18. There was neither pain nor undue elevation of temperature at any time after the operation, and, on the whole, the case is, I think, a fairly typical one, even including its rather tardy convalescence.

Dr. Kendall's case.—One year ago Private F. H. P., of the Hospital Corps, had an attack of "colic," which laid him up for about a week. Nothing more was thought of it until February 5, 1897, when a second attack occurred; this increased in severity until, on February 9, for the pain, a hypodermic of morphine was given. The next day, when seen by the surgeon, a diagnosis of acute appendicitis was made; and the patient upon looking back recalled a month or six weeks of soreness in his abdomen, together with bloating and tenderness, so that he was in the habit of unbuttoning his trousers waistband for relief.

At the time of examination, February 10, the patient had a steady temperature of 101°; slight tympanites; considerable pain; had been costive for several weeks, a condition not normal with him, and had marked tenderness when the vermiform appendix was pressed. The condition gradually subsided and he was again reported for duty February 14. Being continually under observation, repeated and frequent examinations disclosed the fact that his temperature was always a little elevated, and that pain and tenderness in the right iliac region were constant. The appendix, which could be mapped out, was slightly enlarged and very sensitive. The patient, having signified his desire to have an operation performed, was prepared in the usual way. For two days preceding that set for the operation he was given a hot bath and the abdomen was scrubbed thoroughly with green soap. On each of these days one-half ounce of Epsom salt was administered, and on the day preceding the operation he was ordered a milk diet and salol, 0.330, every six hours. On the morning of March 13 nothing was eaten. The patient received salol and an injection, thoroughly emptying the bowel; the abdomen was again scrubbed with green soap, and this having been rinsed off, a moist bichloride towel, 1-1,000, was applied and remained in place until the patient was upon the table. At 11 a. m. ether was used as an anæsthetic, the abdomen was wiped off with ether and alcohol, and a 2-inch incision parallel with the fibers of the external oblique muscle was made over McBurney's point. The appendix was easily found, but not so easily brought into a position where working was easy; this, however, was gradually accomplished. It was somewhat enlarged and intensely congested, as indeed were all the parts surrounding it. The mes-appendix having been ligated with chromicized catgut, an attempt was made to turn in the stump (the appendix having been amputated) and close it with a Lembert suture. This proving difficult, notwithstanding that the stump had been forcibly dilated, it was abandoned. The mucous lining having been thoroughly destroyed with a thermocautery, a ligature of strong silk was thrown close around the base of the stump. The patient being somewhat weakened, the abdominal wall was sutured with four interrupted silkworm-gut sutures, which passed through all the layers at once, care being taken to get the edges in apposition. Two or three interrupted catgut sutures superficially placed completed the operation. An iodoform gauze dressing, covered with sterilized hygroscopic gauze, was applied and held in situ by means of adhesive straps.

Recovery was uninterrupted, the temperature touching 100° but once, and that on the evening of the day of operation. On the fourth day the wound was dressed and found in perfect condition. One superficial and one deep suture were removed. On the sixth day the wound was redressed and all the stitches removed; the wound had healed and the patient, except for some tenderness, felt as well as ever. During the first twenty-four hours the patient received nothing but hot peppermint water; during the second twenty-four hours, hot water, with a teaspoonful of brandy occasionally and 2 ounces of milk in divided doses. Gas, which accumulated to a moderate extent, was liberated by means of a rectal tube. The bowels were freely moved on the morning of the second day after operation, following two doses of 15.000 each and two doses of 7.500 each of Epsom salt. Considerable pain was experienced by peristalsis, but all subsided as soon as the bowel was relieved of gaseous and liquid contents, and the patient slept well for several hours immediately afterwards.

As everything had progressed perfectly, the patient was allowed to sit up on the eighth day; but this was too soon, as indicated by a slight rise in temperature, which quickly subsided when the patient was returned to bed. On the fourteenth day he was allowed to sit up and walk around a little, and as there was no reaction in his temperature he was pronounced cured and allowed his clothing, but cautioned about any overexertion.

Dr. Torney's case.—Case No. 5450, Cadet Hospital, United States Military Academy, West Point, N. Y. T. F. M. Operation January 1, 1896, for a recurrent appendicitis. The attack was of an explosive character, and had been preceded four years previously

by one of a milder type, which had, however, confined him to bed at that time for a period of ten months. It was ushered in by constipation for two days, with nausea and vomiting on the morning of January 1, 1896. There was severe pain in the right iliac region and a temperature of 104° F. A painful tumor in the region of the appendix vermiformis was easily outlined.

As the symptoms were increasing in severity, the patient was prepared for operation as soon as possible. This was commenced with a short incision, which was enlarged to 3 inches after the abdomen was opened, in order that the firm adhesions of the first attack might be torn and the appendix exposed. Upon removal the organ was found to be enlarged and gangrenous in one spot about one-half inch in diameter. The cæcum also was involved in the inflammatory process. The wound was closed with some difficulty, because of the board-like condition of the wall of the abdomen. Two days after the operation a fecal fistula formed. The incision was then reopened, the foreign matters washed out, and a drainage tube inserted. This was kept in for three days and then removed. The wound finally closed January 21, and the patient was returned to academic duty on the 25th, as he was anxious to stand his class examination, which had taken place during his illness, and to make up the time lost from his studies. He was still retained in the hospital and was making good progress in his academic work when, on February 20, he had an attack of influenza, which prostrated him to such an extent that he was prevented from preparing for another examination, which occurred early in March of that year. He was then granted a sick leave until January 6, 1897, but returned to duty August 29, 1896. At present writing he states that his health is perfect, and that he takes part in all violent athletic games, with the full belief that the operation has resulted in a perfect cure.

Dr. A. C. Girard's case.—July 27, 1896.—E. C., corporal Company A, Sixteenth Infantry. Diagnosis: Appendicitis. Complains of pain in abdomen. Returned from practice march this day. Had been eating unripe apples and had colic resulting. No diarrhea, but vomiting for two days; chilly; feverish at night. No history of prior attack. Patient 28 years old, eight years in service, florid, robust, about 155 pounds. Does not appear distressed. Temperature, 100°; pulse, 76. Abdomen not swollen; on pressure intense pain near McBurney's point; tumor plainly felt, about size of small hen's egg; muscles tense.

The severity of the pain, compared with the short duration of the illness and the plain tumor, convinced me that the process in the appendix was an acute one, and would result in gangrene and perforation unless early operation was performed. Directions were therefore given to prepare for laparotomy, while I telephoned to Salt Lake City for Dr. Pinkerton, a noted surgeon in that place. The patient could not realize that he had to be operated on, as he did not feel very sick, but on my mentioning Dr. Pinkerton and my intention of operating only in case the latter agreed with me, he submitted.

Dr. Pinkerton arrived in a short time, accompanied by Dr. Worthington, and these gentlemen, with Assistant Surgeon De Shon, agreed with me as to the necessity of immediate operation.

I made an incision over McBurney's point along the outer edge of the rectus and without notable incident opened the abdominal cavity (serum infiltrated the transversalis fascia, confirming the diagnosis). On entering the fingers into the abdominal cavity I could at once feel the appendix as a tumor of the size of a small egg, and brought it out without difficulty, with omentum covered with fibrinous exudate. The appendix was intact. The omentum was ligated in four pieces with catgut and excised. The appendix was ligated near the cæcum with silk, the distal end being caught in forceps and amputated near the ligature, and the stump treated with pure carbolic acid. The mesenteriolum was ligated en masse with catgut and the whole returned into the abdominal cavity. The wound was then united as follows: Continuous suture of catgut for the peritoneum; mattress suture of fine silver wire for the fascia with a catgut suture for adipose tissue, and a subcutaneous Marcy silver-wire suture for the skin. Aseptic gauze and a binder completed the dressing.

The patient recovered well from the ether, and was allowed one-half ounce peppermint water (according to Morris), diluted, every half hour, to allay thirst and as an intestinal antiseptic. Evening temperature normal. Feels fairly well, but complains of dorsal position, which, however, is insisted on. Urine drawn by catheter. Hypodermic of morphine 0.016, to insure rest.

July 28.—Patient has slept well and has but little pain, but temperature is 101.4°; pulse, 96. Dressing not disturbed. Enema of soapsuds; urine drawn by catheter early in the morning; since then passed normally. Milk. Evening temperature, 102.2°; pulse, 108. Complains of pain in back and headache; right lateral position allowed. Tongue clear and moist; no tympanites.

July 29.—Temperature, 101.2°; pulse, 94. Slept well. Headache. Outer dressings changed, as the discharge from the wound appears. Allowed milk and lime-water, equal parts, as the plain milk distresses him; light farina pudding. Evening temperature, 102°; pulse, 100. Hypodermic of morphine.

July 30.—Passed quiet night. Temperature, 101°; pulse, 88. Dressings changed as before; no discharge. Ordered enema as before. Diet same. Evening temperature, 102°; pulse, 86.

July 31.—Temperature, 100.6°; pulse, 96. Slept well after hypodermic of morphine. No headache; tongue normal; bowels costive; enema of warm soapsuds; bandage not soiled. Evening temperature, 100.6°; pulse, 80.

August 2.—No marked change until to-day. Temperature fell to nearly normal in the morning and rose to 100.5° in the evening. Tenderness became marked below the incision. An accumulation of pus was suspected, and preparation was made to open the incision in case the symptoms became more urgent.

August 3.—Temperature in the afternoon rose to 102°; pulse, 92. The tender area appeared puffy. No general tenderness of abdomen, nor tympanites. General condition good. Magnes. sulph. in broken doses moved bowels freely. At 8.15 p. m. temperature fell to 100°.

August 4 and 5.—No change. Owing to good general condition of patient I concluded to await natural evacuation of pus through incision.

August 6.—Purulent discharge of about one-half pint, with fecal odor, through lower angle of incision. Patient felt greatly relieved.

August 7.—Decided fall of temperature. Washing out of pus cavity with warm sterilized water and introduction of a drainage tube about 5 inches long, which was removed on the 22d, discharge having ceased, and convalescence progressed without interruption. First solid food August 18. He will be discharged, for expiration of term of service, October 12.

The specimen was forwarded to the Museum. No foreign body was found in the lumen of the appendix; the whole organ was enormously swollen and appeared gangrenous.

OPERATIONS FOR THE RADICAL CURE OF HERNIA.

During the past two years 79 cases of hernia have been operated on by army surgeons: Officers, 3; enlisted men, 64; military cadet, 1; discharged soldiers, 4, and civilians, 7. The history of each case has been followed as far as possible to date, with the development, so far, of three instances of recurrence. In one (see note 15 below) a second operation was performed with success; in the two others (notes 16 and 16½) the men declined further operation and were discharged for disability. The occurrence of phlebitis in two of the cases is a subject of interest (see notes 12 and 19 below). In both instances the phlebitis affected the left leg, the operation having been performed on the opposite side. In one the disease was mild and did not delay convalescence; in the other the phlebitis became developed in the right internal saphenous vein, and the man was discharged for disability about six months after the operation.

Cases operated on for the radical cure of hernia.

Name.	Organization.	Age.	Hernia.	Date of operation.	Operator.
M. H.....	Discharged	60	R. fem., 20 yrs.....	Aug. 3, 1895	Lieut. Col. W. H. Forwood, deputy surgeon-general, Washington, D. C.
L. C. S. (1)..	.....do	46	L. ing., 4 yrs.....	Sept. 12, 1895	
H. H	Pvt., M, 3 Art.....	36	L. ing., obl., 2½ yrs .	Sept. 29, 1895	
R. L. Z.....	Pvt., K, 3 Art.....	29	R. ing. obl., 3 yrs...	Oct. 18, 1895	
N. B. P	Discharged	32	L. ing. obl., 10 yrs..	Jan. 5, 1896	
L. S	Corp., F, 6 Inf.....	28	R. ing. dir., 1½ yrs..	Jan. 19, 1896	
L. B.....	Pvt., C, 4 Art.....	26	R. ing. obl., 1 yr....	Apr. 19, 1896	
J. S	Pvt., G, 5 Art.....	34	R. ing. obl., 5 yrs...	May 10, 1896	
D. L.....	Pvt., G, 17 Inf.....	26	R. ing. obl., 1½ yrs..	June 7, 1896	
A. H. M. (2)	Cadet.....	20	R. ing. obl.....	June 19, 1896	
J. R. C.....	2 lieut., 2 Cav	26	L. ing. obl., 3½ yrs..	July 24, 1896	
A. K. (3)...	Corp., G, 5 Art....	29	R. ing. obl., 8 mos..	Oct. 4, 1896	
E. L. S.....	Late Bd., 1 Inf....	39	L. ing., 7 yrs	Oct. 18, 1896	
M. D. McR. (4).	Civilian.....	20	R. ing., 1⅞ yrs.....	Nov. 15, 1896	
R. R. D. (5).	Pvt., I, 4 Art.....	24	R. ing. obl., 6 wks..	Dec. 4, 1896	
N. D. (6) ...	Pvt., F, 9 Inf.....	33	R. ing. obl., 5 wks..	Dec. 23, 1896	
C. S. (7)....	Pvt., C, 21 Inf.....	34	R. ing. obl., 6 mos..	Jan. 24, 1897	
M. K. (8)...	Sergt., C, 21 Inf...	48	R. ing. obl., 1½ yrs..	Mar. 11, 1897	
C. R. H. (9).	Pvt., C, 21 Inf....	33	L. ing. 1⅓ yrs.....	.....do	
L. H. (10)..	Band, 5 Art.....	24	L. ing. obl., 2⅔ yrs .	May 9, 1897	
H. F	Pvt., B, 2 Art.....	23	R. ing. obl., 3 mos...	June 20, 1897	

Cases operated on for the radical cure of hernia—Continued.

Name.	Organization.	Age.	Hernia.	Date of operation.	Operator.
L. W	Pvt., Ord	35	L. ing. obl., old	Jan. 7, 1896	
C. C	Pvt., F, 19 Inf	23	L. ing. obl., 4 mos	Jan. 9, 1896	
P. F	Pvt., D, 11 Inf	40	R. ing. obl., 1 mo	Mar. 26, 1896	
J. Y	Pvt., A, 19 Inf	31	do	Apr. 3, 1896	
J T	Pvt., D, 20 Inf	26	R. ing. obl., 2½ yrs	Apr. 8, 1896	Maj. J. M. Banister, surgeon, Fort Leavenworth, Kans.
A. N	Mus., F, 6 Cav	25	L. ing. obl., 1½ yrs	June 27, 1896	
R. G. (11)	Pvt., A, 9 Cav	29	L. ing. obl.	Aug. 10, 1896	
McC. F. (12)	Pvt., Hosp. Corps	37	R. ing. dir. 2 mos	Aug. 17, 1896	
E. C. (13)	Sergt., Ord. Detach.	48	L. ing. obl. 10 yrs	Nov. 9, 1896	
J. H. (14)	2d lieut., 19 Inf	30	L. ing. obl.	Nov. 23, 1896	
P. K. (15)	Mus., 8 Inf	23	L. ing. obl., 3½ yrs	Feb. 3, 1897	
P. K. (15)	Mus., 8 Inf	21	L. ing. obl., 2 yrs	Dec. 12, 1895	
T. B	Civilian		L. ing. obl.	June 20, 1896	
A. P. W	Sergt., I, 9 Cav	33	R. ing. obl., 1 yr	July 15, 1896	
A. E. R. (16)	Sergt., E, 9 Cav	31	L. ing. obl., 1½ yrs	July 28, 1896	Maj. H. McElderry, Fort Robinson, Nebr., and Fort Leavenworth, Kans.
J. C. W. (16½)	Pvt., D, 9 Cav	22	R. ing. obl., 3 mos	Aug. 2, 1896	
W. H. P	Sergt., F, 20 Inf	38	L. ing. dir.	Nov. 25, 1896	
E. H	Pvt., G, 2 Cav	23	L. ing. obl.	Dec. 19, 1896	
E. F. B	Pvt., A, 11 Inf	21	R. ing. obl.	Mar. 6, 1897	
W. B	Pvt., H, 10 Inf	47	R. ing. obl., 2½ yrs	Dec. 10, 1895	Maj. S. Q. Robinson, Fort Reno, Okla.
C. W. J	Mus., H, 1 Cav	23	R. ing. obl., 1 mo	May 28, 1896	
E. B	Pvt., B, 25 Inf	23	L. ing. obl., 1 yr	Feb. 18, 1896	Capt. W. D. Crosby, Fort Missoula, Mont.
W. M	do	25	R. ing. obl., 2 mos	May 20, 1896	
C. H	Pvt., D, 4 Inf	30	L. ing. obl., 2 mos	June 9, 1896	
F. W. H	Pvt., C, 14 Inf	25	L. ing. dir., 3 mos	Feb. 25, 1896	Capt. R. G. Ebert, Vancouver Barracks, Wash.
G. L	Pvt., A, 1 Inf	35	R. ing. obl., 11 mos	July 18, 1896	
H. S. (17)	Corp., M, 5 Art	37	R. ing. obl., 9 yrs	Oct. 6, 1896	Capt. G. L. Edie, Presidio of San Francisco, Cal.
J. H. (18)	Pvt., A, 3 Art	27	R. ing. obl., 5 wks	Apr. 15, 1897	
E. S	Sergt., Bd., 3 Art	43	L. ing., 4½ yrs	June 3, 1897	
P. S	Corp., G, 3 Art	23	L. ing. obl., 6 yrs	July 20, 1897	
L. M. S	Pvt., Bd., 5 Cav	25	R. ing. obl., 9 mos	Dec. 7, 1895	
R. S. W	Civilian	23	L. ing. obl., 5 yrs	Jan. 19, 1897	Maj. L. M. Maus, Fort Sam Houston, Tex.
J. P	Pvt., Hosp. Corps	43	L. ing. dir., 12 yrs	Feb. 4, 1897	
E. M	Pvt., Bd., 5 Cav	27	L. ing. obl., congenital.	Feb. 22, 1897	
T. M	Sergt., G, 13 Inf	25	R. ing., 3 mos	Oct. 15, 1896	Maj. A. H. Appel, Fort Porter, N. Y.
E. M	Child	10	L. ing. obl., congenital.	Aug. 24, 1896	
A. S. (19)	Pvt., Bd., 3 Inf	25	R. ing., 2 mos	Oct. 1, 1896	Capt. W. C. Borden, Fort Snelling, Minn.
H. P. G	Corp., H, 3 Inf	25	R. ing. obl.	Feb. 28, 1897	
H. L. De V.	Pvt., D, 19 Inf	29	R. ing.	Apr. 29, 1897	
Mr. ——	Civilian	36	L. ing., 26 yrs	Dec. 17, 1896	Lieut. C. E. B. Flagg, Fort DuChesne, Utah.
L. V. D	Pvt., A, 1 Cav	25	L. ing., 3 mos	Jan. 16, 1897	Maj. A. C. Girard, Fort Douglas, Utah.
J. F	Sergt., E, 15 Inf	52	R. ing. obl., 2 yrs	Mar. 17, 1897	
R. J	Pvt., B, 24 Inf	28	R. ing., 8 mos	Apr. 7, 1897	
M. E. S. (20)	Civilian	28	L. ing., recent	May 16, 1897	Lieut. H. M. Hallock, Fort Logan, Colo.
J. F	Sergt., A, 7 Inf	41	R. ing. obl.	June 10, 1897	
G. R	Pvt., D, 15 Inf	24	L. ing. obl.	July 21, 1897	
M. J. L	Sergt., K, 5 Cav	42	L. ing. obl.	Oct. 2, 1896	Capt. W. P. Kendall, Fort Brown, Tex.
M. J. B	Pvt., E, 18 Inf	25	R. ing. obl.	Oct. 4, 1896	
T. J. O	Sergt., H, 23 Inf	32	do	June 3, 1897	
G. H. C	Pvt., A, 3 Cav	25	L. ing. obl.	June 10, 1897	Capt. W. F. Lippitt, Fort Leavenworth, Kans.
F. L. H	Pvt., H, 4 Cav	24	R. ing. obl., 2 mos	Sept. 12, 1896	Capt. J. L. Phillips, Fort Walla Walla, Wash.
C. P	Civilian	21	R. ing. obl.	Apr. 1, 1897	Lieut. J. H. Stone, Fort Riley, Kans.
O. B. M	Capt., Ord		R. ing., 21 yrs	Feb. 18, 1897	C. C. Craig, attending surgeon, Rock Island Arsenal, Ill.
E. L. T. (21)	Pvt., G, 9 Cav	34	R. ing. obl., recent	Nov. 2, 1896	
J. Q. (22)	Pvt., F, 12 Inf	42	R. ing. obl., 4 mos	Jan. 13, 1897	
G. W. A. (23)	Pvt., A, 8 Inf	30	R. ing. obl., 2 mos	Feb. 23, 1897	Maj. L. A. La Garde, Fort Robinson, Nebr.
[illegible] (24)	Pvt., E, 8 Cav	33	L. ing. obl., recent	Apr. 3, 1897	
G. P. B. (25)	Sergt., A, 8 Inf	33	R. ing. obl., 9 mos	May 11, 1897	
F. H. B. (26)	Pvt., Bd., 12 Inf	35	R. ing. obl., recent	May 25, 1897	

REMARKS ON CASES OPERATED ON FOR THE RADICAL CURE OF HERNIA.

(1) L. C. S. Two sacs, one oblique and one direct.
(2) A. H. M. Associated with retained testicle.
(3) A. K. Fort Monroe, Va., August 21, 1897. Result: "Cicatrix at seat of operation firm and strong. Corporal K. states he has lifted heavy weights and indulged in athletic exercises."
(4) M. D. McR. "Complicated with undescended testicle, right side. The testicle was retracted in the abdomen and could not be found or drawn down. Result, cured."
(5) R. R. D. Fort McHenry, Md., August 19, 1897: "The operation is considered to have been perfectly successful."

(6) N. D. Madison Barracks, N. Y., August 21, 1897: "The hernia is properly and apparently permanently reduced and the wound entirely healed. * * * The operation was a complete success."
(7) C. S. Plattsburg Barracks, N. Y., August 17, 1897: "Parts are all satisfactorily healed, and he reports he is free from discomfort."
(8) M. K. Plattsburg Barracks, N. Y., August 17, 1897: "The result of the operation may be regarded as entirely successful."
(9) C. R. H. "The bladder was firmly connected with the inner portion of the sac and was brought out through the wound, its identity being verified by the passage of a sound per urethram." Plattsburg Barracks, N. Y., August 17, 1897: "States that he was operated upon for cystocele; some tenderness remains, but is steadily decreasing, and is no longer a source of inconvenience. * * * Result has been successful."
(10) L. H. Fort Hamilton, N. Y., August 24, 1897: "Incision thoroughly healed and scar in very healthy condition. There has been no return of hernia, and patient regards himself as perfectly well."
(11) R. G. Fort Robinson, Nebr., November 6, 1896: "There is no impulse on coughing, the union of the canal walls seems perfect, and the result may be said to be absolutely satisfactory."
(12) McC. F. "Phlebitis of the internal saphenous vein of the left side appeared on the sixteenth day after the operation and when the wound had healed by first union. The phlebitis was due to constitutional causes, and was in no way induced by the operation. It disappeared sufficiently by October 10 to justify his return to duty. I was informed afterwards by Dr. Perley that a phlebitis of the corresponding vein of the side opposite to that first affected had developed. Dr. Perley agreed with me that the phlebitis was due to constitutional causes and was in no way induced by the operation, the latter having been performed on the side opposite to that first affected by phlebitis." This man was discharged February 1, 1897, on account of chronic phlebitis of both legs.
(13) E. C. Indianapolis Arsenal, December 30, 1896: "Careful examination demonstrates that the hernia is cured, and that all has been done to prevent a recurrence which surgical skill can effect."
(14) J. H. "His hernia is cured, and I have every reason to believe that the cure will be permanent." Fort Wayne, Mich., February 3, 1897: "I find the wound entirely healed and, so far as I can tell, the operation is a perfect success."
(15) P. K. "Was operated upon at Fort Robinson, Nebr., December 12, 1895, by the Bassini method. Relapse occurred in this case in April, 1896, about four months after the first operation. Second operation performed at Fort Leavenworth, February 3, 1897. Was returned to duty May 20, 1897, and left for proper station with hernia cured."
(16) A. E. R. Discharged on surgeon's certificate of disability, December 17, 1896, on account of recurrence following operation. Major McElderry states, in reporting this case, that as the sac was not down in the canal at the time of the operation it was not ligated or cut off. Assistant Surgeon Lynch reports the recurrence as follows: "On August 5, on account of Major McElderry's departure from the post, I came into charge of the case. The soldier was kept in bed for three weeks from the date of the operation, then allowed to sit about the ward for about ten days. At the end of this time he was permitted to walk a little in the wards and on the porch, examinations being made daily. After he had been up for a few days I felt a very slight impulse and again put the man to bed for a week. At the end of this time the slight impulse that had been felt could no longer be detected and he was allowed, on September 17, to go to duty with the remark "cure incomplete." This had no reference then to the recurrence of the hernia, but to the general condition of the man after undergoing an operation of this character. At that time, though there was no impulse, I feared, as I was confident I had at one time felt a very slight impulse, that it was a grave question whether the cure would be lasting. Sergeant R.'s troop was at this time in the field and he had little to do at the barracks, being in charge of troop property. He was directed to report at once to me if he felt the slightest weakness at the point of rupture. On October 4 he returned to the hospital with a recurrence of the hernia. It was then about the size of a hen's egg, easily reducible, with a large external ring. On this date I called Major La Garde's attention to the case." Major La Garde in forwarding this report remarks: "I first saw the man October 4, as stated by Assistant Surgeon Lynch. There were no lesions to note other than the fact that the man had a small inguinal hernia, easily reducible, through a rather large external ring. The hernia was easily kept up with a properly fitting truss. The man's condition, when I saw him, was no worse, I should judge, than before any surgical relief was attempted."
(16½) J. C. W. Discharged on surgeon's certificate of disability, April 14, 1897, at Fort Washakie, Wyo., on account of the recurrence of the hernia. The man declined further operative treatment.
(17) H. S. "To gain absolute rest and immobility of the parts, a plaster of paris dressing was put on over the usual aseptic dressing."
(18) J. H. "In the four cases * * * in which I have done this operation I have employed a thick plaster of paris dressing over the usual aseptic dressings, and attribute much to this procedure for the good results in the four cases."
(19) A. S. "Phlebitis appeared in the left leg on the eighth day after operation. The phlebitis pursued a rather mild course, declining steadily after its second day, and the patient sat up on the twenty-second day following the operation." "In this case the occurrence of the phlebitis is of interest. It is difficult to understand causative relation between the operation and the phlebitis in view of the facts that the wound healed by first union, that there was no suppuration, not even a small stitch abscess, that the phlebitis was on the left side, that the right leg was not involved or the region of wound inflamed, and that up to the eighth day the temperature was slight and showed only the surgical rise and the slight elevation due to the absorption of serum and buried, sterile, animal sutures. These facts have caused me to consider the phlebitis an intercurrent trouble rather than a sequence."
(20) M. E. S. Strangulated and complicated with undescended testicle.
(21) E. L. T. "The union was firm at the end of the third month, and it has continued so ever since. He has been doing mounted duty since January 30, 1897."
(22) J. Q. "Fort Niobrara, Nebr., August 26, 1897: It appears that the operation has been successful. He performs all his duties and states that he is entirely free from pain or inconvenience of any kind."
(23) G. W. A. Fort D. A. Russell, Wyo., August 22, 1897: "This soldier is now absent on the annual practice march, to return about September 3. Upon his arrival he will be examined and the result transmitted immediately. To the best of my knowledge the operation was a success up to the time of his departure."
(24) J. S. "At the end of the fourth week the patient was allowed out of bed with a perfect result. In a recent letter he informs me that he is doing duty with no signs of recurrence of his old trouble."
(25) G. P. B. "He left the hospital July 13, 1897, cured. In a recent letter to Acting Hospital Steward Simmel he states that he is perfectly well."
(26) F. H. B. "The patient was allowed out of bed at the end of the fourth week. While visiting Fort Niobrara, August 13, 1897, I saw the patient, who told me he was perfectly well with no sign of a recurrence."

SANITARY CONDITION OF THE ARMY.

QUARTERS.

The quarters provided for the enlisted men of our Army at posts recently built are excellent in their sanitary arrangements. At some of the old posts the buildings are more or less in want of repair, sometimes overcrowded, with inadequate ventilation and primitive methods for the removal of wastes. Every year, however, shows some improvement in the condition of these posts. It is to the credit of those concerned that when attention is called to remediable sanitary faults by the monthly reports of the medical officer immediate action is taken by the commanding officer if it lies within his power or by an allotment of money for the purpose by the Quartermaster's Department. In illustration of this steady improvement in sanitary conditions, a few extracts from the reports are given.

FORT CANBY, WASH., *December, 1896.*—During this month the old, worn-out, unserviceable, insanitary water-closets in the rear of the officers' quarters, for the use of servants and in the headquarters building, have been replaced by new siphon, front-flush, sanitary closets, and the post has thus made a distinct advance in its general sanitary condition.

FORT LEAVENWORTH, KANS., *May, 1897.*—An allotment of funds having been allowed the quartermaster for the purpose of remedying the damp and wet cellars of the officers' quarters at Riverside by subdraining these quarters on the outside and properly cementing the cellar floors and walls inside, as recommended by the surgeon in his sanitary report for March last, the work was begun some time ago and is now in progress.

ST. FRANCIS BARRACKS, FLA., *October, 1896.*—The dormitory occupied by Battery C is in good repair, fairly well ventilated, and only moderately overcrowded, the cubic air space being 606 feet. The barrack occupied by Battery M is a dilapidated old structure. The woodwork is rotted throughout and the plaster is continually falling off. Frequent repairs have been made, but the timbers are so badly decayed that further repairs are impossible without renewal of much of the underpinning and floor joists. The two buildings occupied by the noncommissioned staff are old, dilapidated, and almost uninhabitable. The sills and joists are rotted away in many places. The floors have sunken several inches. These buildings are unsafe, being liable to severe damage in case of high wind storms. They should be demolished, as no repairs can make them safe and habitable.

ST. FRANCIS BARRACKS, FLA., *February, 1897.*—The barracks occupied by Battery M are undergoing repair. The two buildings occupied by the noncommissioned staff are being repaired.

ANGEL ISLAND, CAL., *October, 1896.*—The insanitary condition of officers' quarters No. 5 will probably be corrected during the month, as an allotment of $125 has been made for the purpose.

In January, 1895, Maj. H. McElderry, surgeon, Fort Robinson, Nebr., instituted an investigation into the ventilation of the dormitories at this post on account of an unusual prevalence of tonsillitis among the men. He recommended a system of winter ventilation, and in November, 1895, the inlet ducts had been constructed and openings made under the stoves, but the jackets for the stoves, the foul-air exits, and the cylinders for the stovepipe were not in place. Concerning this delay Col. Dallas Bache, assistant surgeon-general, indorsed on a sanitary report January 13, 1897:

The ventilation of the barracks has not received the attention, or rather, the fruitful attention, that its importance deserves. The sanitary reports of the whole year 1896 reiterated the recommendations of successive medical officers upon the subject, and the presumption was that the slight effort in labor and small expense in material would be applied. The simple method of jacketing the stoves, beneath which the cold air is introduced, and introducing several upcast shafts into each dormitory, is too well known to need description. The absence of ventilation is one of the marked factors in the production of the infectious diseases of the throat to which attention is drawn in this report. I strongly recommend that instructions be given to have the necessary work done at once.

On this the chief quartermaster of the department recommended that a thorough inspection of the drainage and ventilation of the barracks and quarters be made March 1, at the time of the annual inspection, and that estimates be submitted for putting them in first-class condition. This met with the approval of the department commander. In his report for February, 1897, Maj. Louis A. La Garde, surgeon of this post, noted that, with two exceptions, the men's barracks had no ventilators by which an exchange of air between the space under the floor and the outside could be obtained. He pointed out that this could easily be remedied, and urged the importance of doing so as soon as possible.

At Vancouver Barracks, Wash., Surgeon Hoff invited attention in several of his reports to the unsatisfactory ventilation of the barracks. He urged that a man who sleeps under a window or near a door will not keep it open to his own discomfort in order that those at a distance may have fresher air. To give a definite basis to Major Hoff's remarks, Dr. Kulp, the assistant surgeon at the post, made an analysis of the air in the barracks of Company G, Fourteenth Infantry, at 2 a. m., April 22, 1897, finding therein 13.12 parts of carbon dioxid per 10,000 of the air. The floor space per man was 51 square feet and the air space 510 cubic feet.

Insufficient ventilation of barracks was also reported by Maj. H. McElderry, surgeon, Fort Leavenworth, Kans. The buildings, according to his report, are heated by steam radiators, but only in two of the rooms are there inlet apertures for fresh air connected with the radiators. The heat, therefore, soon becomes oppressive and the air saturated with animal effluvia. There are outlets in the ceiling in nearly all the dormitories, but as no provision has been made for the entry of fresh air these outlets have little value. Dr. McElderry recommended the direct-indirect method for these buildings.

Capt. W. O. Owen, assistant surgeon, Fort Bayard, N. Mex., invited attention December 15, 1896, to the limited air space of three of the companies at his post. His recommendations were approved by Lieut. Col. Woodhull, chief surgeon of the department, and February 8, 1897, an expenditure of $2,148 was authorized for the construction of wooden additions to the barracks of these companies.

Dr. Owen's statement.—Since the arrival of the Fifteenth Infantry there have been 43 cases admitted to sick report from companies D, E, and G, having 420 cubic feet air space each, while the other four organizations have had only 29 admissions, they having 730 cubic feet. When injuries and venereal cases are deducted from the above totals the cases become 25 in the first three companies and 13 in the other four. Of the 25 cases 17 were tonsillitis and febricula, and are believed to be due to the small floor and cubic air space, while of the 13 in the other companies only 5 were due to the same cause.

Dr. Woodhull's remarks.—Sore throats and the undefinable disturbances classed as febricula, generally depend upon an imperfect air supply, and these rapidly spread where ventilation is imperfect. Insufficient air space is bad, but inadequate renewal of air is worse. From Dr. Owen's statement it appears that disease generally prevails in the proportion of 2.5 to 1 in the more crowded over the less crowded quarters, and of those forms distinctly recognized as depending on impure air the proportion is 6.6 to 1. This means a great want of fresh air. I have no personal knowledge of the arrangement at Fort Bayard, but the thirteenth of the accompanying photographs shows the old fashioned box-like quarters and one of the two holes that are in the ceiling. There is a stove at the farther end, and presumably another stove near the foreground. It may be, as I have known in other barracks, that the openings in the ceiling do not pass directly through the roof, or it is possible that they do. Distinct provision should be made for the ingress of fresh air, which probably can best be done by jacketed openings at the stove and for the exit of the contaminated air by a series of small shafts from the ceiling through the ridge. Or air might be introduced and led out by bent pipes under the eaves and along the sides of the barrack. The rooms should certainly not be allowed to remain in their present condition.

The casemates at Alcatraz Island, Cal., have been utilized as kitchens, gymnasiums, and amusement rooms, thereby improving the sanitary conditions of the barrack rooms by increasing the available space.

Complaint was made at several of the posts concerning the character of the quarters occupied by married soldiers. For instance, in speaking of the drainage and sewerage of Fort Niobrara, Nebr., Lieut. P. C. Fauntleroy, assistant surgeon, states that on one side or the other of each of the laundresses' quarters the water used in washing clothes is emptied on the ground, and the garbage from most of these houses is disposed of in the same way. Some old cavalry stables are partitioned off to quarter the families of married soldiers. A bad odor arises from the ground around these stables. The post surgeon, Lieut. T. S. Bratton, indorsed upon this report that there were 49 families of enlisted men, comprising in all 144 persons, living at the post, whose quarters were unconnected with the sewerage system, and he recommended that every company commander be required to inspect on Saturday morning the quarters, privies, etc., of the married men of his company as he would inspect the barrack space and bunk occupied by each of the men in the general dormitories. On this the chief surgeon commented as follows:

The quartering of families of enlisted men in vacant stables and other outbuildings not intended or suitable for habitation is a sanitary transgression that is sufficiently clear and likely, as in this case, to bring its own punishment. It is unreasonable to spend large sums in post sanitation, particularly in the disposal of waste, if a population not of emergency, but of expediency, is allowed to perpetuate the very evils which have been laboriously corrected.

At Whipple Barracks, Ariz., also, the quarters occupied by the married soldiers are reported as a disgrace to any military post, on which the chief surgeon remarks with truth that these families have no official status and that at best they are an obstruction to military efficiency. So long as shelter of any kind is to be found at a military post it will be occupied by the outcome of unauthorized marriages, and oftentimes to the prejudice of health. These old buildings which induce the presence of unauthorized camp followers should be destroyed, or if a legal status be given to these families the quarters provided for them should be put into satisfactory sanitary condition.

On this subject I desire to cite the remarks I made in my report for the year ended June 30, 1893, page 100, and to reiterate the recommendations therein made, that public quarters be provided for a limited number of married men in each organization, all others being strictly prohibited from having their families at the post.

The quarters occupied by married enlisted men at some of our posts are wholly unfit for occupancy. Reference has already been made incidentally to those of San Carlos. Those at Fort Yates are described as wretched. Casemates are occupied at Fort Warren where, from the chill, dampness, and bad air, the children are anæmic and show signs of rachitis. At Fort Grant these quarters are in bad repair and crowded to the point of indecency. At Fort Vancouver they are reported as scarcely habitable, built on ground honeycombed with disused privy pits and cesspools. At Fort Missoula the old log huts thus occupied should be destroyed, as also some shanties owned by a civilian and rented to married soldiers. The best of these, constructed by the soldiers for themselves and families, at Fort DuChesne, are of logs, but most of them are of scrap lumber eked out with condemned canvas and old coal-oil cans, the rooms without flooring, small, damp, and dark. Sanitary improvements can not be instituted at the expense of the occupants, and at present there are no means for effecting them in any way. Quarters like those at the posts mentioned are breeding places for disease, and as garrisons become larger the problem of quarters for the married soldiers is likely to become more complex. I recommend a return so far to former methods as to provide public quarters for a limited number of married men in each organization, all others being strictly prohibited from having their families at the post. A provision of this kind would be regarded as a privilege awarded to deserving soldiers and would permit the whole of these huts and shanties to be destroyed.

DRAINAGE AND SEWERAGE.

Defective drainage was reported from a few of our military posts during the past year. For instance, Maj. J. D. Hall, surgeon, stated, April, 1897, that some of the outlying grounds in the neighborhood of Fort Wadsworth, N. Y., were of a marshy character, and evidently gave origin to malarial diseases. The quartermaster was directed to prepare estimates for the draining of these marshes.

The want of satisfactory drainage is seen also in the following from Fort Slocum, N. Y., Fort Ringgold, Tex., and Jefferson Barracks, Mo.:

FORT SLOCUM, *December, 1896.*—The same high rate of malarial fever noticed last month has continued to prevail this month. During August and September there have been 7 cases in Battery B, 8 cases in Battery M, and 18 in Battery H. The quarters, food, and water being identical for the three batteries, the reason for the much greater proportion of cases in Battery H can only be attributed to the close vicinity of the fresh-water pond. The water in this pond is slightly brackish, more or less stagnant, full of aquatic weeds, and the immediate shore is covered with rank grass. I believe a thorough cleaning of the pond and shore is necessary. The dilapidated stone wall should be repaired, the shore raised where needful, and a wide sand or gravel walk made all around it so as to prevent the growth of rank vegetation near the edge. This pond furnishes ice in winter and very good skating, and in summer would make a pretty and attractive feature of the island; but in its present condition it appears to be chiefly a breeding place for mosquitoes and malarial germs.

FORT RINGGOLD.—The new sewer system for the disposal of all liquid waste has been completed during the month. With an ample fall, tight joints, good system of manholes, and five flush tanks, this sewer system would doubtless be satisfactory for many years to come. It has capacity enough to carry off, if desired, the outflow from latrines and water-closets for the whole post, and these can be built now at any time. There is no natural drainage, owing to the flat surface of the ground in the post, and as during the last two months it has been unusually rainy, pools of water have stood for days around some of the buildings. I believe in consequence of this, and the almost constant dampness of the air, the sick report for November shows a very unusual number of cases of bronchitis, and many light cases of bronchial trouble and tonsillitis have occurred, which do not appear on the report.

JEFFERSON BARRACKS.—The garrison has been comparatively healthy during the past month, but the trying condition of the weather and the backwardness of spring, with the frequent rains, have caused a great prevalence of colds and other catarrhal affections of the air passages. A number of mild cases of malarial fever have also been observed, and are believed to have originated about the stables, where the men have to spend a good portion of their time, particularly in the early morning, when the human system is more apt than at any other time of the day to be affected by morbid influences. The damp and unsanitary character of the site of the stables is well known and need not be enlarged upon.

Evidently at Fort Niagara, N. Y., the drainage is inefficient, for in September, 1896, Capt. H. I. Raymond reported that drains were being laid around the officers' quarters, and in the following month he urged a similar improvement with regard to the hospital.

Foundation drains are being laid around the officers' quarters, which will insure correction of all present unsanitary conditions pertaining thereto. The Castle and other buildings in the Old Fort are unprovided with proper drainage and water-portage systems, and the result is that sufficient water is not used for bathing and cleansing purposes, and laundry and kitchen waste water is not conducted into the lake. These buildings are damp and unhealthy habitations, and the correction of the above-mentioned defects is essential to placing them in a comparative state of sanitation. Foundation drains, if none exist, are also desirable. It were better, in my opinion, that these buildings be not occupied than to be used as habitations in their present condition.

During the rainy spells water rushes up through the breaks in the cement of the cellar floor of the hospital. This cement is always damp, and, consequent upon rains or melting snows, pools of water collect upon the cellar floor for lack of foundation drains. The cement is very thin and badly cracked, and there is need of a proper cement floor being laid in the cellar. It is my intention to submit estimates therefor in my next annual estimate for hospital repairs, but it would be useless to lay such a floor with subsoil drainage unprovided for.

At Fort Trumbull, Conn., the subsoil drainage of the quarters of the noncommissioned staff was reported January, 1897, as defective, particularly the quarters of the post quartermaster-sergeant, which was represented as being constantly saturated with moisture. Plans and estimates to remedy this were referred to the Quartermaster-General. At Fort Brady, Mich., also, the drainage is unsatisfactory. In the spring, when the ground is saturated with the melting of the snow of the preceding winter, several of the buildings are damp. See, for instance, the following from the sanitary report for March:

I have made a careful inspection of this post during the month, and find it to be in a most satisfactory condition, with the exception that many of the officers' quarters and the guardhouse, during the present thaw, have more or less water in the cellars, and a damp cellar under a dwelling house is a serious menace to health.

The privy pit is still in use at a few of our military posts, as noted in the following report, January, 1897, from Fort DuChesne, Utah:

Most of the privies of the post are small houses placed over excavations, the houses being removed when the excavations become nearly full. The nuisances of these structures are too well known to require enumeration. The few earth closets in use at the post (one of which is at the hospital) from which the dirt is removed daily, are entirely satisfactory from a sanitary aspect.

At the large and important post of Fort Keogh, Mont., the privy pit continues in existence. In September, 1896, the post surgeon noted that the pits were too full and recommended that new ones be dug. An estimate for the construction of dry-earth closets was forwarded.

A slight improvement on the privy pit is found at Angel Island, Cal., but it does not meet with the approval of the chief surgeon of the department, as may be gathered from the following:

The water-closet arrangement for the men is in about the same condition as when I last inspected it in March, 1895. It consists of a shed built over a wide trough which connects with the sewer and contains about a dozen stalls, each having a V-shaped aperture immediately over the trough. The place is surrounded by a lattice, along one side of which is the urinal. The trough is flushed every morning and the place is kept clean, but it is more or less malodorous, and the whole affair is a good many years behind the time. A properly constructed water-closet and urinal for each barrack is recommended.

The dry-earth system of sewage disposal gives satisfaction at quite a number of our military posts, but the utmost care is needful in carrying out the details. It should not be necessary for any medical officer to have to report that—

There is no evidence of the systematic use of dry earth in any of the men's closets,

or to recommend—

That troop and company commanders be directed to see that dry earth is systematically used in the closets of their organizations. All these closets have recently been repaired and provided with zinc-lined boxes which do not leak. A little care and attention only are needed to keep them in as good sanitary condition as is possible under this system.

The necessity for cleanliness in the management of urinals is manifested in the following from Capt. H. I. Raymond, assistant surgeon, Fort Niagara, N. Y.:

On request of the officer of the day for disinfectants for ridding the guardhouse urinals of bad odors, I at once made an inspection and noted the faults in the sanitary care of these receptacles. The flush water had been turned off or used very inconstantly. The urinals had not been properly policed with hot water, soap, and scrubbing brush—in short, cleanliness had not been observed, but in its default resort had been had to lowering of the window sash to allow foul odors to escape, and to the use of deodorants. Prevention through cleanliness is attainable, and the

use of disinfectants where no specific infectious material is present, or of deodorants where the odors are preventable by the proper use of water, soap, and brush, is not only wrong in principle but is a reproach to the sound sanitary sense of the present time.

Disinfectants are to be used only where there is an infection to be destroyed. Cleanliness in this instance, as in many similar instances, is all that is required. In this connection medical officers are referred to circular of August 9, 1893, from this office, from which the following is cited:

Antiseptics and deodorants are useful when it is impracticable to remove offensive organic material from the vicinity of human habitations, but they are a poor substitute for cleanliness.

Some faults in the plumbing were discovered at Fort Robinson, Nebr., as concerned in the occurrence of repeated obstructions in the soil pipe under the cellar floor of certain of the officers' quarters. Major La Garde's report is illustrated by two diagrams showing what was found and what was done to remedy the conditions.

During the early part of the month the soil pipe in quarters No. 25 was stopped up. The obstruction was located in a U trap, just before the soil pipe passes through the cellar wall to empty into a 6-inch drain that leads to a sewer. The soil pipe in the cellar is placed below the floor, buried in concrete. At my recommendation the quartermaster exposed the pipe and all its connections. The diagram, Fig. A, shows what we found. It will be seen that the waste from the laundry tubs emptied into the pipe leading from a water-closet near by, and that the pipe carrying the sewage from these entered the soil pipe under the concrete at right angles. This had a great deal to do with the clogging at the U trap, because the force of flushing was lost in the numerous bends, as shown in the diagram. To correct this fault we emptied the waste from the laundry and contents from the water-closet into the soil pipe as shown in Fig. B. The U trap was removed entirely, as there was no room to place a trap on the inside of the wall. A running trap will be placed in the 6-inch drain beyond the cellar wall in a few days.

The plumber informs me that the fault mentioned herein exists in all the frame quarters occupied by officers, and that the clogging is frequent in the vicinity of the U trap. As opportunity offers I should recommend that the pipes from the laundry and closet of all these frame quarters be carried into the soil pipe at an acute angle, and that running traps be placed in the drain outside the cellar wall. I believe that the quartermaster has no traps on hand, and I recommend that estimates be made for the necessary number.

In November, 1896, Capt. T. U. Raymond, assistant surgeon, Fort Canby, Wash., reported an obstruction in the main sewer in front of the quarters of the hospital steward, with overflow of sewage on the ground, and cases of acute follicular tonsillitis in the family of the steward. The quartermaster took immediate steps to remove the obstruction.

The surgeon of Fort Leavenworth, Kans., Maj. H. McElderry urged in November, 1896, and again in April, 1897, a general test of the efficiency of the plumbing of the post, calling for oil of peppermint for this purpose. The expenditure of 296 ounces of this oil was authorized by the Quartermaster-General, but no report has yet been received from Dr. McElderry. His communication of April 7, 1897, reads as follows:

A case of acute follicular tonsillitis, followed by acute diphtheria, has occurred at the post during the past week—a child, 4 years old, in the family of Lieut. W. H. Smith, Tenth Cavalry, occupying one of the set of quarters, No. 5, on the hillside of that part of the post known as Riverside. Upon testing the plumbing in this set of quarters by the peppermint test a defect was found in the plumbing—there being a large hole concealed by a tin covering in the vent pipe from the water-closet bowl. Of course the breathing of the foul sewer air, which thus permeated these quarters, produced the disease. As diphtheria is a filth disease, and as its occurrence at a post is justly considered by sanitary experts as a distinct reflection on the medical officer responsible for the sanitary supervision of the post, I would respectfully invite attention to the following remarks and recommendations in my sanitary report for

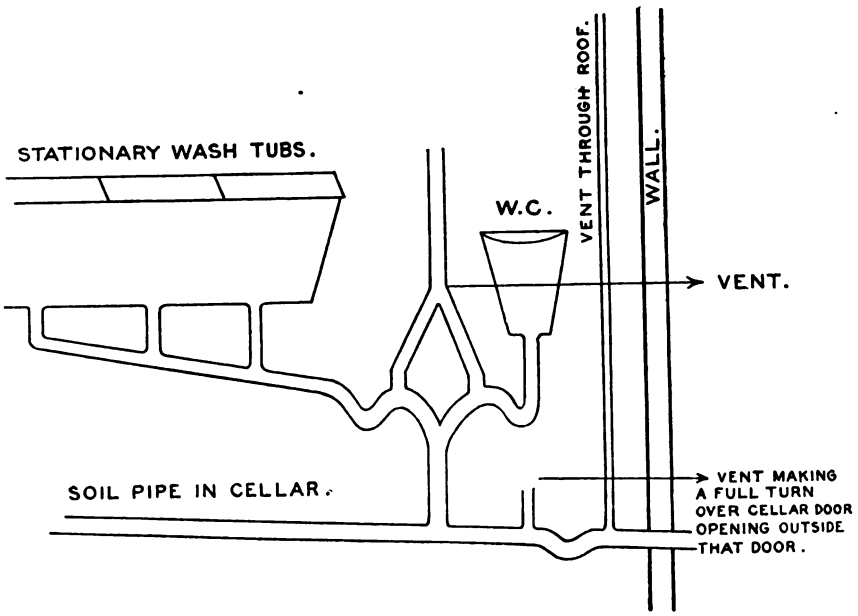

STATIONARY WASH TUBS.
W.C.
VENT THROUGH ROOF.
WALL.
VENT.
SOIL PIPE IN CELLAR.
VENT MAKING A FULL TURN OVER CELLAR DOOR OPENING OUTSIDE THAT DOOR.

FIG. A.

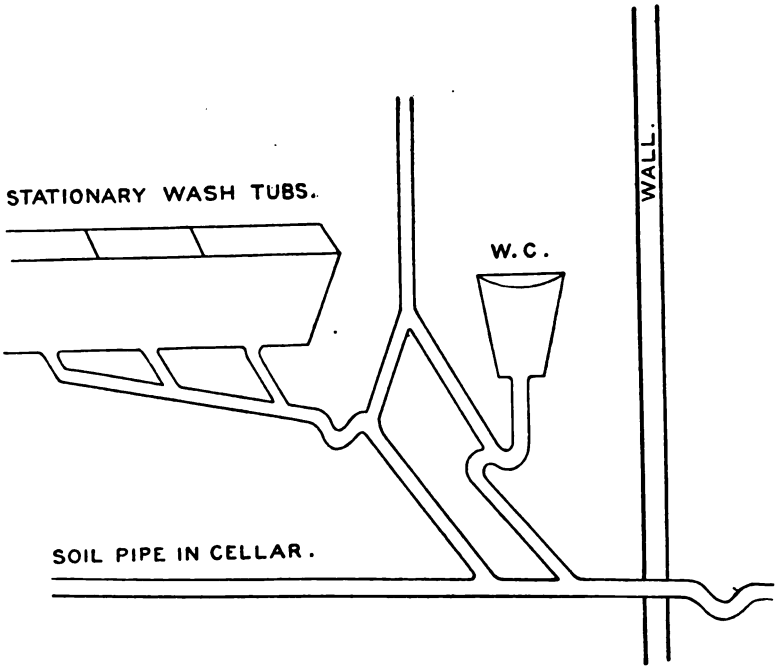

STATIONARY WASH TUBS.
W.C.
WALL.
SOIL PIPE IN CELLAR.

FIG. B.

November, 1896, the first report made by me after joining the station: "The drainage and sewerage of the post, as far as I have been able to examine them, appear to have been constructed on proper sanitary principles and to be satisfactory. As, however, the quartermaster informs me that the plumbing about the post has not been tested for a long time, and as much of it appears to be old, I would respectfully and urgently recommend that all the plumbing about the post in each of the quarters of the officers and of the men be systematically tested, as soon as practicable, with the peppermint test, and that if leaks in any of the pipes be found they be promptly repaired, and the plumbing again tested to insure their soundness. Oil of peppermint, for this purpose, has always been furnished on special requisition by the Quartermaster's Department at other posts where I have served."

In my report for the year ended June 30, 1893, page 118, I stated that the addition of grease traps to kitchen sinks or house drains was recommended by two or three medical officers during the year. These traps, when suitably arranged and carefully attended to, are theoretically of use in connection with the waste-water pipes of large messes, particularly where there is an insufficient fall. Practically, they are so liable to become a nuisance when the necessary care is intermitted, that it is questionable whether their use in any case can be recommended. They are certainly needless in the kitchens of officers' quarters, as care on the part of the cook and an occasional flushing with lye will keep the pipes clean. The presence of grease traps in the system at St. Francis Barracks did not prevent a choking of the main sewer. Efficient flushing renders such traps unnecessary.

During the month a stoppage in the main-sewer pipe occurred, due to a large accumulation of grease on the inside of the pipe. The sewer was opened at several points before the obstruction was definitely located, and this coating of grease was observed to be general, and ranging from 1¼ inches in thickness to almost complete obliteration of the caliber of the pipe. This condition was caused by the grease traps being inadequate and by the action of the hard sulphur water on all greasy substance and the backwater during high tides; the latter dams the water in the sewer and allows the grease to settle on the upper surface of the pipe.

The imperfect disposal of the sewage of Fort Logan, Colo., by irrigation, led to a correspondence between the health commissioner of the city of Denver and myself. Dr. William P. Munn, the city official, invited attention to the possible pollution of the Denver water supply by this sewage, and desired to know whether it would be possible to arrange for its disposal either by a sewer connecting with the nearest district sewer of Denver or by a thorough and certain method of irrigation. In reply, I stated that I had made careful inquiry into the conditions at Fort Logan, and had found that the sewage is disposed of satisfactorily during the growing season by irrigation on a farm in the neighborhood of the post. During the winter the owner of this farm has been accustomed to allow the sewage to escape by means of an open ditch into the river. The board of health of Arapahoe County objected to the open ditch, and in accordance with its suggestions arrangements were made to pipe the sewage into the stream. In view, however, of this objection of the health officer of the city of Denver, work on this pipe line, which was already two-thirds finished, had been suspended. Dr. Munn was informed also that the attention of the proper authorities had been invited to the faults in the disposal of the sewage of Fort Logan, and that, as the owner of the farm had ground enough to dispose of the whole of the sewage and appeared to be willing to continue to use it, an arrangement satisfactory to the health authorities of Denver would probably be reached without difficulty.

The sanitary report from Key West Barracks, Fla., June 30, 1897, gives information that a well yielding a daily supply of about 10,000 gallons of excellent water has been dug. The surgeon recommended

that this water be utilized for the purposes of bathing and establishing a system of sewers with water-closet connections. This project, from the indorsements on the report, appears to have met with approval, and will soon be carried into effect.

WATER.

A temporary deficiency of water was experienced at Fort Monroe, Va., during prolonged dry weather at the close of the year 1895. This will be unlikely to occur again, as, according to Surgeon Moseley's report for September, 1896, contract had been made for the use of water from the Newport News Water Company.

The insufficient supply at Fort Warren, Mass., has also been remedied during the past year. Since 1894 most of the water supply had to be brought from Boston by steamer, as the pipe connection with Gallups Island was not protected from injury by frost on land nor from leakage at sea resulting from the strain of tidal currents, the dragging of anchors, etc. In November, 1896, the surgeon reported that:

> During the month the contractor finished laying submerged water pipe from Gallups Island to the fort, distant 1,550 feet, and made connection with the city water main. Water was turned on November 12, and the post since then has been supplied from that source.

In December, 1895, the water supply of the Presidio of San Francisco, Cal., was reported by Maj. J. B. Girard, surgeon, as insufficient and dangerous in its insufficiency on account of the possible occurrence of fires. Again, in August, 1896, Maj. R. H. White, surgeon, cited in his sanitary report for that month, General Orders, No. 87, which announced that in accordance with instructions from department headquarters, until otherwise ordered, all outflow pipes from the reservoir would be closed between the hours of 12 midnight and 4 a. m.; that no water would be used for sprinkling or irrigation, and that the utmost economy should be exercised in the use of the water supply. Major White discussed the insufficiency of the water derived from the sources then utilized, and made the suggestion that water for the post be obtained from the Spring Valley Waterworks. The chief quartermaster, Lieut. Col. A. S. Kimball disapproved of this suggestion, as there was every prospect of obtaining an increased supply by an extension of the existing system.

Maj. R. H. White, Surgeon.—It may be noted that this insufficiency of the water supply has occurred some weeks before the close of the annual dry season, and while the consumption of water has been for months greatly lessened by the absence from the Presidio of the cavalry squadron and the light artillery battalion (the four cavalry troops, with animals, having been on detached service during May, June, July, and August, and the two light artillery batteries having likewise been absent during June and July). It may be specified that the source of the water supply to the Presidio is limited to the sand hills on the peninsula, which treasure up the annual rainfall, and after filtration yield it to the wells located in the valley for its collection and distribution. The exhaustion noted this month shows that the supply of surface water thus provided is quite inadequate to the requirements of the post, and that a comprehensive plan should be immediately adopted to remedy an essential and permanent defect. Mountain Lake and Lobos Creek, as sources of water supply, are liable to the pollutions incident to human population, and recommendation is made that, in common with the city of San Francisco, the Presidio derive its water supply from the Spring Valley reservoirs. This recommendation is offered after consultation, on August 20, with Cols. George H. Mendell and Charles R. Suter, of the Engineer Department, who give it approval, and whose authority should secure its adoption. Under date of May 11, 1896, Colonel Suter made a special report to General Craighill on the water supply of the Presidio, and a copy of this report, "A," is inclosed, with an official report, " B," made on October 8, 1882, by a board specially

convened to estimate the value of Mountain Lake and Lobos Creek as sources of permanent water supply. It may be added that during the summer certain cases of water-borne diseases have been under care in hospital (typhoid fever 1, malarial remittent fever 4, malarial intermittent fever 2); and without unduly urging their significance, it may be repeated that a permanent and adequate supply of pure and wholesome water should now be substituted for the yield already deficient in quantity, always liable to pollution, and a probable source of increasing mischief from the future growth of San Francisco or the assemblage of more troops at the Presidio. The Surgeon-General of the Army having consented to make chemical and bacteriological examination of the water, specimens for the purpose were sent to his laboratory on August 28 from Mountain Lake, Lobos Creek, and the reservoir of the wells now in use. It may be remembered, however, that a chemical and bacteriological proof that a water is impure may be trustworthy and of high value, and that it is equally true that chemical and bacteriological certificates of purity in a water are practically worthless, as such water may be the active agent in the spread of disease when the sources of supply are superficial. There would thus seem to be a question for administration, whether there is here an adequate supply of surface water, and, if so, whether its natural filtration is trustworthy under existing and prospective conditions.

Deputy Q. M. Gen. A. S. Kimball.—One hundred thousand gallons of excellent potable water is supplied daily to the garrison at the Presidio from the new pumping works. In addition to this a well has just been completed on the marsh northeast of the post, which will supply all the water required for the animals at the new stables. Forty drive wells and three additional bored wells 45 inches in diameter are being sunk near the pumping works for increasing the water supply at the post. A tunnel is also being excavated into the Presidio Hill with the hope of obtaining a flow of water into the post reservoirs by gravity. There is every prospect that the efforts for an increased supply of water will meet with success. In view of these facts, until the result of these operations is known, the recommendation that the water supply be derived from the Spring Valley Water Works is most emphatically recommended for disapproval.

The report of Colonel Suter, referred to by Major White, is one discussing the question of providing an adequate water supply for the present and proposed fortifications at and near Fort Point, San Francisco Harbor. It is accompanied by a report from Lieut. John E. Kuhn, United States Engineers, to whom, from his familiarity with the subject, was assigned the duty of making the investigation. An extract, given below, from his report shows the position taken by the engineers. An abstract from the other report referred to by Major White was published in my Annual Report for the year ended June 30, 1893, page 129.

Lieut. John E. Kuhn, United States Engineers.— * * * Before proceeding to a consideration of any plan for a water service, I will describe the present supply of the Presidio garrison by the quartermaster's department. At the time of the abandoning of Lobos Creek as a source of supply the quartermaster's department was forced to supply water for the Presidio. Negotiations were commenced with the Spring Valley Company, but for some reason not known these fell through and a supply was sought in wells driven near the shore of Mountain Lake, whence the water is pumped to several small reservoirs of 550,000 gallons aggregate capacity, located near the garrison and about 100 feet above low water. At first only six wells were driven, but these proving inefficient six more wells were sunk. I am informed by Colonel Kimball, of the quartermaster's department, that the maximum capacity of all the wells with twenty-four hours' pumping is 180,000 gallons. Since the Presidio garrison consumes 90,000 gallons daily, it requires twelve hours' pumping daily to secure this supply. I am also informed that since the plant was put in operation the level of the water in the wells has fallen and that there is serious doubt about the ultimate success of the plant. As it is, the wells are being taxed to their limits by the present demands, and any increased demand will probably lower the water level faster and hasten the failure of the system. The water is of good quality, but very hard. The capacity of the pumping plant is many times the yield of the wells, and if the latter were only sufficient a supply might be obtained for the engineer department from the same source. The quartermaster also informed me that he thought it possible that he would have to abandon the wells and move his pumping plant to Lobos Creek. Efforts are to be made to secure a strip of ground on the south side of Lobos Creek to assist in maintaining the purity of the water. An elevated reservoir 360 feet above low water, located upon Presidio Hill, is also talked of as an additional improvement in connection with the possible future change. If these improvements

are carried out there will be ample water for all purposes on the reservation. As the case now stands the quartermaster has all he can do to supply the Presidio garrison, and the engineer department must seek elsewhere for water. * * *

Before closing the discussion of the subject I desire to call attention to the desirability of having a comprehensive solution of the water problem. The quartermaster's department is working independently of the engineer department. It certainly would result in mutual advantage if both departments could be served by one system of supply which would have a regard for war considerations. Such a system is perfectly feasible either from Lobos Creek, or preferably from the Spring Valley Company.

The waters from the Presidio examined in the laboratory of this office gave results which indicated that the supply from the wells, as represented by samples taken from the main reservoir, and the supply from Lobos Creek are excellent waters, notwithstanding their large amount of chlorin, which is regarded as normal to the surface and subsoil of the locality. The water of Mountain Lake, on the contrary, is evidently an undesirable water. The free ammonia and albuminoid ammonia distilled from it, even after its storage in clean bottles during transportation across the continent, with the large amount of oxygen required and the microscopic characters of its sediment, suffice to condemn it from the point of view of the chemist and microscopist. As a matter of fact, however, this water is not regarded as potable, and is not used for any purpose on this reservation. The analytical results submitted by Dr. William M. Mew were as follows:

Water.	Reservoir.	Lobos Creek.	Mountain Lake.
Solids	46	23	29
Chlorin	12.4	4.1	7
Nitrites	None.	None.	None.
Nitrates	Strong reaction.	Strong reaction.	None.
Free ammonia	.002	None.	.016
Albuminoids	.007	.008	.066
Oxygen required	.040	.120	.480

The figures represent parts per 100,000 of the water. No change on ignition of residues of reservoir and creek waters; no animal life present. A loss of 11 on ignition of residue of water of lake; much blackening, with a slightly suspicious odor; many rotifers in the water.

The water supply of Fort Assinniboine, Mont., is obtained from driven wells of slight depth. The water is pure, but opinions differ as to the permanence of the supply. Formerly water was taken from Beaver Creek, but in 1894 the creek became dry and another source of supply had to be developed.

Capt. P. R. Egan, assistant surgeon, Fort Assinniboine.—The water supply of this post is obtained from pipes driven into the soil for a distance of less than 25 feet. Beyond this distance the pipes, as I understand, sink into a bed of earth and no water is obtained. This fact would seem to point to its being a surface water from the hills or from the creek. Analysis showing it to be a soft water admirably suited for drinking and domestic purposes also supports, in my opinion, the belief that it is a surface water and not a deep, permanent supply. This summer and last have been wet years, and the abundant yield of the driven pipes does not by any means prove that the water question at this post has been permanently settled. Our present supply is an experiment, and until it has stood the test of one or two dry summers an abundant supply of water for this post when garrisoned by a large cavalry command is not by any means an assured fact.

Col. J. K. Mizner, Tenth Cavalry, commanding.—The water supply at this post is obtained through a system of drive wells from a network of springs, and its analysis shows it to be almost absolutely pure. It is known to be better than any other water in this region of country, or, perhaps, in Montana. Beaver Creek is now at its lowest stage, and yet the water supply from the drive wells is just as abundant as when the creek was at its highest stage. The present water supply is entirely independent of Beaver Creek and has no connection with it, as has been satisfactorily proven by every manner of test.

The water supply of Fort Harrison, Mont., appears to be contaminated, as well as deficient in quantity. It is taken from a stream which flows past a small mining village called Rimini, with an additional supply from Minnehaha Creek. Cases of typhoid fever appeared at Rimini last autumn, and not long afterwards a number of cases occurred in that part of Helena which draws its water from this source. About the end of December a child at Fort Harrison became affected, and as soon as the diagnosis was positive, January 5, 1897, an order was issued by the post commander directing that all drinking water be boiled for forty minutes. The population of Rimini varies from 20 or 30 to several hundred persons, according to the condition of the mines. In a report by Dr. E. C. Carter, it is said that the latrines of Rimini drain directly into the stream, but the authorities at Helena assert that this has been discontinued. When the mines are in operation the stream is often turbid from the tailings flowing into it. The post commander, Lieut. Col. W. M. Wherry, Second Infantry, in a communication to the adjutant-general of the department, dated February 18, 1897, wrote as follows:

In compliance with your letter of the 8th instant, I have the honor, in reference to the water supply, in view of the alleged infected condition and liability to infection of the water system of the town of Helena, our present source of supply, to report that it seems an almost insoluble problem.

As is well known, there are a few springs grouped upon the 40 acres at the southwest corner of the reservation, acquired for a water supply for irrigation purposes. These have been tentatively tested to ascertain their capacity, and with a result of not to exceed 25,000 gallons per diem. It was estimated that this water could be accumulated in a reservoir and piped for distribution about the post for about $19,000, and I have in previous correspondence on the subject suggested that it could be further increased, at considerable outlay, by digging drive wells and putting pumping works, etc., in the valley of Seven Mile Creek, north of the post. The post surgeon believes the water from the springs on the reservation to be pure and satisfactory for drinking and culinary purposes, and calls attention to other sources from which water could be obtained in his indorsement, which is inclosed herewith.

The peculiarities of the watersheds contiguous to and about the post, the uses to which the streams are applied, and the acquired ownerships by private parties, together with the extravagant cost, almost preclude the consideration of any source nearer than the Missouri River offering a pure, unfailing and abundant water supply, and the enormous cost of availing ourselves of that source seems to put it beyond consideration, unless it be in the shape of aiding the city of Helena to bring the water of the Missouri to our vicinity and arranging for a joint use, a contingency which I have been led to believe some of the people of Helena hope to bring about at some time in the future.

The post surgeon's indorsement, referred to above, was dated February 15, 1897:

The only practical source of water on the reservation is the spring developed by the late Captain Hoyt, assistant quartermaster. This supplies about 25,000 gallons per diem of good, pure drinking water. Probably the cheapest and most satisfactory method of supplying the garrison with drinking water would be to construct a reservoir to be filled by this spring, and pipe the water into the garrison, supplying in each barrack and set of quarters one faucet to be used for drinking and perhaps culinary purposes. Water of quality, good at present, might be obtained by purchase from two springs near the reservation. Certain shallow wells just off the reservation, less than 40 feet deep, supply a limited quantity of "fair" water. There is a stream about 13 miles from the post, near McDonald's Pass, which could furnish an abundant supply of excellent water. The distance is great, and the expense would be considerable; but that supply would be sufficient and permanent. I know of no other source of water, except the Missouri River 15 or 18 miles distant from post, and several hundred feet lower than the garrison.

Connection with the water supply of a neighboring city does not always satisfy medical officers of the Army that their commands have been supplied with a satisfactory water. At Fort Adams, R. I., the

supply for drinking derived from the Newport Water Works was recommended to be sterilized by boiling, as the surgeon in his report for September, 1896, claimed that there was much sediment in the water, which, as was usually the case at that season of the year, developed a foul odor on standing.

A later report, dated July 27, 1897, by Maj. C. L. Heizmann, surgeon, gives fuller particulars concerning the water supply of this post:

In submitting this report it might be well to review the statements of various eminent chemists who have condemned the Newport water supply as being unfit to drink, and this supply is at present the water used at this post. Dr. Smart (article on water in Reference Handbook of Medical Sciences) states that: "Foul pond waters are sometimes used as public supplies, although they manifestly should not be so used. The water of Easton's Pond constitutes, for example, the city supply of Newport, R. I." On page 17 of a report concerning the Newport Water Works, published in 1892, the following appears: "Comparing the analyses and statements of Dr. Smart, Professor Hills, Dr. Drown, and Dr. Siegfried, covering the period from 1879 to 1892, it will be seen that the water is no better that it was soon after the works were constructed, and that, on the whole, it is worse than when Dr. Smart compared it to 'ditch water.'"

The analyses to-day show no cause for rejoicing, and five years have elapsed since 1892. The water was bad in the beginning, has remained so, and there seems to be no prospect of a better supply in the immediate future.

The water in Easton's Pond is surface water collected from lands used for agricultural purposes to its very edge. It is sufficient to point out that this supply represents a water collected from a surface soiled by the excreta of both man and beast. Further proof would seem unnecessary to prohibit its use for drinking. The water is passed through sand filters into a settling well walled with brick. The supply is then pumped into a T pipe, one arm of the T supplying Newport, the other going into a reservoir which holds a reserve to supply the city during suspension of the pumping. The reservoir was cleaned previous to 1883, and this was due to the distributing pipe bursting. Apparently it is in these receptacles that the organic matter undergoes the greatest amount of decomposition. The water, as drawn from the faucets supplying this command, is frequently of a dirty brown color, and gives off an odor truly disgusting. The water contains all the elements for the growth of low forms of plant life, and should disease-producing germs gain entrance to the supply, they would find an abundance of material for increase.

It is interesting to note that in nesslerizing the free ammonia from sample No. 3 there was present a yellow coloration which somewhat interfered with the process. Furthermore, the albuminoid ammonia found in the fifth and seventh measures was larger than that evolved with the fourth and sixth measures. The same sample, on being examined immediately after collecting, rendered free ammonia in notable amounts in its eighth and ninth measures; at this time the yellow coloration referred to above was quite marked. Whereas, upon reexamining the same sample twenty-four hours later, the results tabulated below were obtained. These traits of a water containing large quantities of recent vegetable matter have been recorded in previous examinations of the Newport water; and it may be stated that the large quantity of oxygen required, and the interference with the development of the ammonia coloration upon adding the reagent, indicate vegetable matter as the source of organic pollution. The chlorin in all likelihood comes from the sea. Again, the increase in solids after the water leaves Easton's Pond corresponds with its increase in hardness and lime salts. This may be due to its passage to the city through cement-lined pipes. As this water has been frequently recommended to be boiled before using for potable purposes, it is assumed that the command is placed in as safe a position as is possible under the circumstances, but the amount of suspended organic matter is quite unsightly.

The well water, listed as No. 4, has been in use during the past thirty years, never drying up, and probably represents the water used before the present supply was established. The results of this analysis verifies the suspicion entertained at the time of collecting the sample, that the well was probably receiving household wastes from the surrounding soil. It certainly shows that a water is available to the citizens of Newport superior to that furnished by the water company. This should encourage the military authorities to develop a local supply for this post.

On July 26, information as follows was conveyed to the adjutant of this post: It has been reported that the men of this command are in the habit of using the water contained in the cistern at the post exchange for drinking. Analysis shows this supply to contain organic matter in a stage of rapid decomposition. This is so marked that, in connection with other data, it might be asserted that the cistern has

been used for unauthorized purposes by men frequenting the exchange. The use of this water should be absolutely prohibited and the cistern closed for the present.

The well known as the "Engineer's well" at the post showed upon analysis that organic matter, probably animal, had gained access to the water. Recommendation was made to have the well cleaned, which was partly accomplished three days before the present analysis was made. Orders were issued for the boiling of this water, as it is almost entirely used for drinking by the families of the officers of this command. There is no doubt that the pollution of this water is the direct result of neglecting to protect the supply. During the past twenty years the well has not been cleaned, and, aside from the feeble attempt at cleansing the well recently, there seems to be no evidence of watchfulness over the care of this water. The cement lining has long since fallen from the walls, and there is seepage from mud holes surrounding the brim of the well. Drainings from the pump wash the filth from the surface into the well. The roof is dilapidated. Old and dirty shingles are floating in the water. Damage to the well and further pollution to the water will certainly result from anything short of removing 10 to 12 inches of dirt from the bottom, cementing the walls, and covering with a concrete hood impervious to liquids. The pump should find exit through an opening about 2 feet in diameter, and a small house, the upper part of which is covered with wire netting, should protect this aperture, and so insure thorough protection and ventilation. A pipe should carry off the waste from the pump to prevent the formation of mud holes about the well. The surroundings should be cleaned up, and depressions which collect water and form pools should be filled in. This water was reexamined on July 28, and the analysis shows that it has improved since settling, and there is no doubt that with proper care it will form a potable and valuable supply of water.

It is the intention to endeavor to secure water at different sites, that Fort Adams may be furnished with good drinking water the year round, independent of the Newport water.

The analysis of water No. 1 justifies my recommendation of January 11, 1896, as to the removal of the water tanks in use at that time. The present tank (the only one at post) was retained in hospital on account of the low water pressure which at times delayed the automatic filling of the hot water boiler. All faucets in hospital deliver this water except one, which is direct from the main pipe. It might be a step in advance to have all faucets deliver Newport water direct, using the tank to supply the hot water boiler in the hospital.

Analysis of water at Fort Adams, R. I., July, 1897.

[Parts per 100,000.]

Sample.	Free ammonia.	Albuminoid ammonia.	Chlorin.	Nitrogen as nitrites.	Nitrogen as nitrates.	Oxygen required.	Total solids.	Loss on ignition.	Hardness as $CaCO_3$.
No. 1. Faucet in dispensary from settling tank	.005	.026	2.2	.003	.085	.460	17.5	2.5	6.38
No. 2. Faucet in kitchen direct from Newport supply	.008	.0228	2.3	.0025	.100	.350	16	4	5.97
No. 3. From Easton's Pond at pumping station	.017	.0436	2	None.	.005	.590	10	6	5.27
No. 4. Oman's Well, Newport, R. I.	.0006	.0026	8	.001	.75	.090	62.5	30	18.04
No. 5. Engineer's Well, Fort Adams	.000	.0022	2.3	Trace.	.58	.035	17.5	7.5	5.55
No. 6. Cistern at post exchange	.000	.0116	8.4	Trace.	3.60	.125	12	5	.....

The quality of the water supplied at San Diego Barracks, Cal., from the city waterworks was called in question by the surgeon, who recommended the construction of cisterns as the best means of having a plentiful and pure supply.

Capt. W. L. Kneedler, assistant surgeon.—The absolute necessity for a supply of good drinking water for the city of San Diego was recognized by the people, and $1,500,000 was voted for the construction of a new water supply. Litigation has so tied up this matter that the most sanguine parties do not expect the introduction of the new water system inside of five years.

Cisterns were also recommended at Fort Canby, Wash., as the only means by which a good water supply could be obtained for this post. The present supply consists of surface drainage impounded in ravines,

its permanence during summer being assisted by the flow from two or three springs of subsoil water.

The drinking water at Fort Robinson, Nebr., as reported by Major La Garde, comes from a number of springs which issue from the banks of a small creek. The water as collected there is bacteriologically pure. Assistant Surgeon Lynch plated the water a number of times on gelatin and agar-agar, and under the most favorable conditions of temperature his results showed only a few colonies per cubic centimeter; but the water pumped to the distributing tank is not always wholly from these pure sources. The watershed of the creek drains an extensive area, which is in part occupied by the population of the new post. The surface water from melting snow flows at times into the creek from the officers' stables and back yards where servants' earth closets are installed. Water also drains from the corral into the creek, in the bed of which are the collecting wells. It was the original intention to make the wells water-tight except at the bottom several feet below the creek bed, but if they were originally impervious they are not regarded as being so now, for the well from which the supply is pumped for the use of the post contained 1,100 colonies during a thaw when there was a large stream of muddy water running down the gully draining the hills, while the water of the same well gave only 77 colonies some time before when the surface water on the ground was frozen. Boiling the water was recommended pending the consideration of the best method of preserving the purity of the spring waters.

Boiling the water was recommended anew in September, 1896, by the surgeon at Jefferson Barracks, Mo., in view of the serious epidemic of malarial and typhoid fever (see supra, p. 73) which prevailed at the post during the preceding two months:

> In view of the carelessness of many of the enlisted men on that score, I must once more insist on the absolute necessity, if disease is to be prevented, of using none but filtered and boiled water for drinking purposes. Company commanders should see that a sufficient supply of such water should be always on hand in each set of barracks for the use of the men.

At Whipple Barracks, Ariz., the companies are all provided with cooled boiled water; but the men visit the town of Prescott where much of the water used is certainly impure. During the week ending June 15, 1897, three cases of continued fever, probably typhoid, were admitted into hospital.

When my report for last year was rendered, the water supply of Fort Custer, Mont., was under examination in the laboratory of this office. The analysis gave excellent results, but it is believed from the general character of the water of the Little Big Horn River that these results were due to changes that occurred in the bottled water during the period that elapsed from the time of its collection to the time of its examination. Dr. Howard's results as given in my last report (page 141), and obtained from the freshly collected water, are more consistent with the characters of a western stream than those given by the bottled samples sent here for analysis. The case as presented against the purity of this river water is that it is at times very turbid from the breaking up of the ice and the melting of snow upon the hills. Again, sometimes it has a foul odor and a disagreeable taste. Organic refuse from an agency slaughterhouse and large Indian camps drains into it. Dr. W. C. Shannon reported as follows concerning it:

> The intake water pipe, about 10 inches in diameter, descends into a well excavated within the main bank of the stream and separated from the low-water bank of running water by 15 feet of a shallow water pool measuring about 1 foot deep of water and several feet of mud bottom. The running water of the river runs by the mouth of

this pool. During high water the current of the stream runs against the base of the crib intake well. The water in the well is 4½ feet deep, and is at the same level as the surface of the pool and stream. The quartermaster and engineer insist that the well and the river sustain the same level always. The drainage from the surrounding banks and adjoining bluffs must be very limited, because the soft soil of the banks is not corroded, and because the topographical levels conduct the drainage away from this site. The same ground is especially free from contamination. The exhaust stream from the pumps, with its film of oil and the washings from the boiler, do, however, empty into the pool in front of the crib.

At present the water is low in the river, but is very clear. Annually we have, during the months of July and August, a considerable variety of acute intestinal disorders. This year a number of cases of typhoid fever have occurred. The first case was fatal, and occurred among a party of traveling emigrants who camped along the river. The second case was also fatal, and occurred in a section house about 20 miles above the post, on the Little Big Horn.

Several soldiers were in the hospital during July with a mild continued fever of a rather limited duration, and now there are two more soldiers sick in hospital with typhoid, one of them of a very mild type.

Recently I visited the Indian agency, about 10 miles above us on the Little Big Horn, and conferred with the agency physician relative to the existence of any continued fevers among the Indians. So far as known nothing in this line exists among the Indians. We visited the outlet of the new sewer of the Indian school. The fecal matter escaping from the sewer was not dissolved, and floated on the surface of the dead water adjoining the banks of the stream.

Dr. Baxter, of the agency, has promised to keep me informed of any suspicious intestinal disorders among the Indians.

Capt. Charles E. B. Flagg, assistant surgeon, reported an analysis of the Uintah River water used at Fort DuChesne, Utah. In parts per 100,000 of the water the dissolved solids weighed only 7.6, the chlorin .4, and the free and albuminoid ammonias each 0.019; nitrates and nitrites were present.

The Uintah River rises in the mountains of that name, about 40 miles distant, and flows through the Uintah Indian Reservation. The only possible sources of contamination are the Indian farms, from which irrigating ditches empty into the river, campers along the banks, and the Indian school at Uintah, 18 miles above the post. The excess of ammonia, nitrites, nitrates, and oxidizable matter may be accounted for by the irrigating ditches. While the water at present is considered good for drinking purposes, bacterial infection from typhoid fever should be carefully guarded against. This may be accomplished with the cooperation of the Indian-service physician at Uintah. * * * The method of distribution of the water is primitive and not altogether satisfactory. In winter water barrels are necessarily kept near a fire to prevent freezing, and as the kitchens are the only available places, the drinking water is liable to absorb gases and become contaminated with other impurities.

A satisfactory water supply for Fort Myer, Va., has been urged in every sanitary report rendered from that post during the year. The character of the Potomac River water at the intake is not good, and the surgeon reports increasing sources of contamination. It is understood, however, that an improvement in the quality of the supply will soon be effected, as funds have been allotted for this purpose.

Capt. W. H. Arthur, assistant surgeon, June 30, 1897: The water is, as heretofore reported, from a highly polluted source. The brewery, near the point of intake, is now in full operation, and the slaughterhouse is approaching completion. The water will soon be entirely unfit for use.

The sanitary reports from Fort Clark, Tex., intimate that the Las Moras Spring was twice flooded during the heavy rains of the autumn of 1896. Surface water and backwater from the swollen stream entered the spring, and on both occasions the water within the protecting caisson was as turbid as that which was not so protected.

It appears from the reports of the surgeon, and the indorsements thereon of post and department authorities, that the water supply of Fort Walla Walla, Wash., is exposed to contamination from the surface. The springs from which the supply is derived are within 100 yards of

the nearest houses; and recently, near and above the water source, gardens have been laid out, the frequent manuring of which will probably affect the water injuriously. According to Capt. John L. Phillips, typhoid fever is endemic in the city of Walla Walla, becoming epidemic in summer. He therefore considers it inadvisable to supply the post by connecting it with the city water system.

Brig. Gen. E. S. Otis, commanding department, April 13, 1897.—The unsatisfactory health of the Fort Walla Walla garrison, concerning which I have already commented, is believed to be largely due to the insufficiency and quality of its water supply. In that belief the post surgeon recommends, and the post commander directs, the thorough boiling of all drinking water during the warm months of the year. The supply is obtained from springs (doubtless surface springs) situated in marshy land close to the city of Walla Walla, in the immediate vicinity of which dwellings will soon be constructed. It is piped to the post, and costs the Government in rental $300 yearly. In all, excepting the dry months, quantity appears to be abundant, and no complaint is then heard of its quality; but it is evident if Fort Walla Walla is to be maintained some other source of water supply must be secured. The subject will be investigated with a view to improvement in quantity and quality.

The water of the deep wells at Fort Barrancas, Fla., was reported by the surgeon as too heavily charged with iron to be satisfactory for domestic use. These wells were sunk about five years ago to render the post independent of rain-water supplies. Samples of the well water examined at that time contained a notable quantity of iron, but this condition was reported as temporary, and due to an insufficient coating of the interior of the new iron pipes. Otherwise the water was good. Water from the spring referred to in the following extract from the sanitary report for January, 1897, was examined at the same time, and gave excellent results.

Capt. W. C. Gorgas, assistant surgeon.—I recommend that the present water supply be abandoned and the spring at Fort Redoubt be used as a source of supply.

The harmful influence of unflushed dead ends in a system of water distribution on the quality of the water supplied, is noted by Maj. Valery Havard, surgeon at Fort Slocum, N. Y. He recommends a triweekly flushing of all the pipes connected with hydrants to remove the foul sediment that accumulates in them.

Water is conveyed by pipes from the New Rochelle Reservoir directly to the post buildings. The supply is abundant, but not always as good as it should be. Experience has proved that on account of "dead ends" on the island frequent flushings of the mains are necessary to keep the water pure and wholesome. * * * In view of the great importance of wholesome drinking water, I respectfully recommend that three times a week—Tuesday, Thursday, and Saturday—all the hydrants without exception be opened for a few minutes, or as long as necessary, to render the water perfectly clear and tasteless. This end will be more completely attained by opening as many of the hydrants as possible simultaneously.

Lieut. W. M. Cloud, assistant surgeon, Fort Sill, Okla., under date of June 30, 1897, forwarded the results of an analysis of the post well water, and also of the water of Medicine Bluff Creek, both of which appear to be good:

Well water, June 1, 1897.

Color	None.	Nitrites	None.
Odor	None.	Nitrates	.3
Taste	None.	Chlorin	1.8
Total solids	20.	Oxygen required	.3
Loss on ignition	6.	Total hardness	9.5
Free ammonia	.0005	Temporary hardness	1.5
Albuminoid ammonia	.0015	Permanent hardness	8.

On ignition the residue blackens quickly, the blackness quickly disappearing. The sample of water is good. The large amount of oxygen required and the large amount of nitrates are probably due to vegetable organic matter.

Medicine Bluff Creek water, June 23, 1897.

Color	Slightly turbid.	Nitrites	Trace.
Odor	None.	Nitrates	.31
Taste	None.	Chlorin	2.
Total solids	22.	Oxygen required	.35
Loss on ignition	6.	Total hardness	9.
Free ammonia	.001	Temporary hardness	2.
Albuminoid ammonia	.007	Permanent hardness	7.

Analyses of the water supply of Fort Bayard, N. Mex., and of the ice supply obtained from Silver City, N. Mex., were made recently by the medical officers of the post, Capt. W. O. Owens and Lieut. W. H. Wilson:

[Parts per 100,000 of the water.]

	Free ammonia.	Albuminoid.	Chlorin.	Nitrates.	Nitrites.	Oxygen required.	Total solids.	Loss on ignition.	Calcium carb.	Magnes. carb.
Water	0.002	None.	1.4	0.015	None.	0.15	27.7	8.15	18.2	Trace.
Ice	None.	None.	.32	.033	None.	None.	(a)	None.	None.	None.

a Total solids from 100 c. c. were too small to be weighed with scales on hand. When the solids of the water supply were ignited only a faint brown tint was observed, and this disappeared very rapidly. The water obtained from the ice supply indicates a source of exceptional purity. It contained a very small amount of sediment, which was found to be composed of wood fiber from the sawdust of packing, sand, red and blue cotton fibers, and remnants of algoid growth.

An examination of the ice supply at Fort Leavenworth, Kans., was reported by Maj. H. McElderry. The ice was from Merritt Lake, and gave good results: Free ammonia, 0.0025; albuminoid ammonia, 0.005; chlorin, 0.1 part per 100,000.

An analysis by Dr. William M. Mew of a shallow well water from Sandy Hook, N. J., showed a chemically satisfactory condition:

Solids	18.0
Chlorin	4.5
Nitrites	None.
Nitrates	Trace.
Free ammonia	Trace.
Albuminoid ammonia	0.005
Oxygen required to oxidize organic matter	0.112

The chlorin was considered due to the marine locality, as the drainage area was unpolluted.

A report of a chemical and bacteriological analysis of the water supply of Vancouver Barracks was forwarded by the surgeon. A sample drawn from a tap in the hospital yielded 0.0013 free ammonia and 0.007 albuminoid ammonia, with traces of nitrates and nitrites. A sample taken from a bathroom tap adjoining one of the squad rooms gave a slight solid residue which did not blacken on ignition. Samples collected February 4 and 26, and March 9, gave a mean of only 39 bacterial colonies. An alga grows at certain seasons in the water of the reservoir at this post. It floats in roundish masses or covers the surface with a greenish scum, giving the water a disagreeable color, odor, and taste. Recommendation has been made to have the reservoir covered, as it is found that the exclusion of light prevents the growth of the organism. Lieut. Franklin M. Kemp, assistant surgeon, submitted a report of his investigations into the contamination of the water supply, and if his observations as to the different forms which he studied are correct, the alga is undoubtedly quite closely related to the Spheroplea annulina. Should the plant reappear in the water before the reservoir is provided with a roof, specimens will be forwarded

to the Department of Agriculture for the consideration of the experts in the division of vegetable physiology and pathology. Lieutenant Kemp reported as follows:

I have the honor to respectfully submit the following report of the investigations conducted in the hospital laboratory of the contamination of the water supply of this post with certain forms of algæ.

The growth consists of a green filamentous plant, existing as a scum upon the surface, or conglomerated into masses, varying from 1 inch to 3 inches in diameter.

About 10 gallons of the water were taken from the reservoir and placed in an ordinary wooden washtub, protected by a covering of wet sheeting. This served as a basis of supply during the ensuing observations and experiments.

A. The determination of the chemical properties of the water at the time of collection:

An analysis of the water at the time of collection gave the following results:

[Parts per 100,000.]

Nitrites	Absent
Nitrates	Absent
Free ammonia	.0325
Albuminoid ammonia	.007
Oxygen required	.02
Chlorin	.024

On igniting the residue, fumes of a peaty odor were evolved, the discoloration developed slowly and persisted for a long time.

B. The estimation of the effect of the plant's growth upon the water or other media in which it exists. An analysis of the water at the end of ten days gave the following:

[Parts per 100.000.]

Nitrites	Absent
Nitrates	Absent
Free ammonia	.050
Albuminoid ammonia	Trace
Oxygen required	.02
Chlorin	.025

Gas was evolved in small quantities, which on examination proved to be hydrogen.

To 1 liter of the water lactose was added in the proportion of 1 per cent. The evolution of hydrogen in this case was very marked when the specimen was subjected to the action of sunlight, but diminished and finally ceased when kept in the dark. Under the latter conditions, however, butyric acid was found to have developed, the amount of hydrogen and acid found in each case bearing to each other an inverse proportion. It would seem, then, taking the production of hydrogen on one hand and of butyric acid on the other as indices of the vitality of the plant, that the presence or absence of sunlight had a direct bearing upon its growth. The truth of this hypothesis was demonstrated by the microscopical appearances of the plant under these varying conditions:

C. The behavior of the plant under varying conditions of light and temperature, and the influence of other agents or conditions upon its vitality.

Microscopically it presented the following forms:

1. Long filaments composed of quadrangular cells placed end to end, containing chlorophyll more or less uniformly distributed, the whole being inclosed in a mucilaginous envelope. (Fig. 1.)

2. Pyriform cells from two to three times the diameter of a red blood corpuscle, the pointed extremity being transparent, the body containing a green endochrome. Some of these cells were very motile, and on staining with iodine many of them were seen to have two flagella proceeding from the narrow pointed end. (Fig. 2.)

3. Circular green cells of the same size as the former and in various stages of segmentation. (Fig. 3.)

4. Cells containing a reddish or reddish-brown endochrome.

5. Ovoid forms containing a green endochrome, some of them having a vacuolated appearance and nonmotile. (Fig. 4.)

6. Long, slender fusiform cells, some containing transverse markings, the green endochrome differing in quantity and distribution. (Fig. 5.)

7. Very small colorless refractive bodies pyriform in shape, endowed with great motility, darting from place to place across the field, and presenting two flagella when stained with iodine. (Fig. 6.)

The filamentous structures, as free as possible from other forms, were separated and placed in beakers containing respectively the following media: (1) Filtered water.

(2) One per cent solution of lactose. (3) Pasteur's solution, viz, water 100 parts, ammonium tartrate 10 parts, ash of yeast 10 parts, lactose 1 part.

One beaker containing the filaments in filtered water was placed in the light and another in a dark incubator at 37.5 C. At the end of twenty-four hours the beaker that had been placed in the incubator was examined and no material change was found to have occurred either in the medium or the plant which it contained, other than the appearance of a few green circular cells some of which were motile. At the end of forty-eight hours the filaments presented less chlorophyll in their constituent cells, while all motility had ceased in the round cells. The water gave a slightly putrid odor and taste, and examination revealed the presence of butyric acid. At the end of four days all chlorophyll had disappeared from the filaments which were observed to be in various stages of disintegration; and at ten days all filaments had disappeared, only a few greenish, almost colorless round cells remaining.

In the two other media, viz, the 1 per cent lactose and Pasteur's solution, the same changes were observed when sunlight was excluded, namely, a progressive

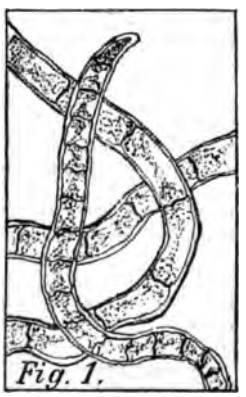


Fig. 1.

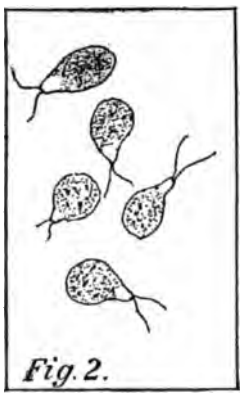


Fig. 2.

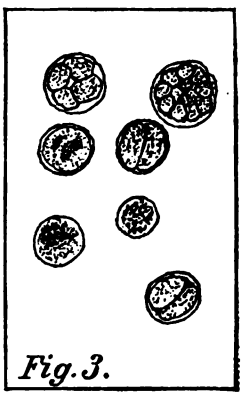
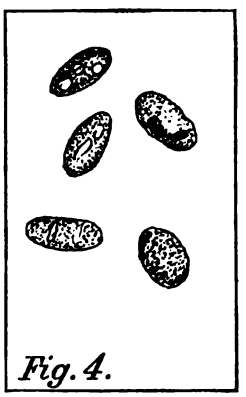


Fig. 3.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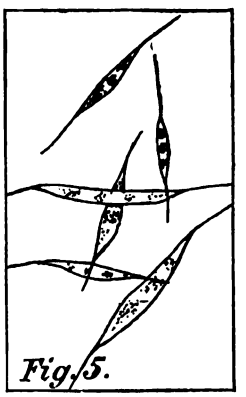
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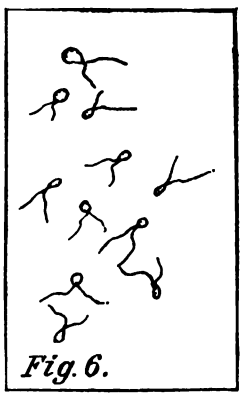
Fig. 6.

degeneration of the plant until nothing remained but granular detritus. Similar results were obtained when the cultures were kept in the dark at room temperature.

Beakers of the same media were also inoculated with the green circular cells, entirely free from filaments and subjected to the same conditions. Although the degeneration in this case was not as rapid, still there was never any active growth, the chlorophyll and finally the cells themselves disappearing until nothing but granular material remained. From this it may be deduced that the circular forms were much more resisting than the filaments. The same effects were observed in beakers placed in the dark at room temperature.

Under the influence of sunlight the results obtained differed materially from the above. A little of the filamentous material was thoroughly washed in running water to free it from other forms, placed in a 1 per cent lactose solution, and exposed to indirect sunlight.

Close observation at this time showed that the morphological characteristics of the constituent cells of some filaments differed materially from those observed in others, admitting of a classification of the filaments into two chief varieties:

(1) Those in which the endochrome was uniformly distributed.

(2) Those in which there was more or less differentiation of the endochrome amounting in some cells to an aggregation into different masses. These masses were of two varieties.

(*a*) Large circular bodies with a green endochrome, overlapping each other within the filament (fig. 7) and identical in appearance with the free circular form seen in fig. 3.

(*b*) Small colorless pyriform bodies, very numerous, closely packed within the remains of the constituent cells of the filament (fig. 8) and identical in appearance to the small refractive cells seen in fig. 7. At the end of three hours many of these bodies had escaped from the filaments, some moving across the field, others adhering to the sides of the filaments containing the green circular forms, while others seemed to have penetrated the mucilaginous envelope of the latter filaments and to have come in contact with the cells therein contained.

At the expiration of twelve hours, specimens from the same beaker were examined and the following results noted: The large circular cells were seen to have escaped in many instances from the filaments; and while the majority of the cells thus freed seemed to maintain their integrity, many were observed in various stages of segmentation. Small green ovoid cells, endowed with motility, and evidently the outcome of the above process, were now observed.

No further change occurred in this beaker other than a gradual loss of chlorophyll and the disintegration of the constituent elements of this plant, the filaments disappearing first and the free circular green cells last.

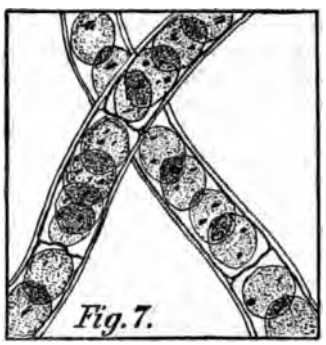

Fig. 7.

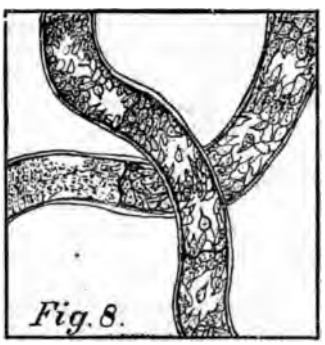

Fig. 8.

Profiting by this experience, foreign bodies, such as bits of wood, stone, and absorbent cotton were introduced into the beakers. Here the same processes were observed as in the former experiments; with the exception that the plant instead of degenerating after reaching a certain limit, went on to further development as follows:

The ovoid bodies liberated by the segmentation of the free circular cells increased in size, became pyriform, and finally lost their motility. Very slender fusiform structures were soon detected, the smaller of which were translucent, the larger presenting a tinge of chlorophyll and faint transverse markings. Slender filaments, with rounded ends, were next observed, a little longer than the fusiform bodies; the endochrome here was differentiated into segments more or less distinct, while the chlorophyll was more abundant. These were evidently the immature forms of the filaments seen in fig. 1, as shown by their rapid growth in length and breadth to correspond to those structures. These changes continued for over a week, but finally ceased, and at the expiration of three weeks total degeneration of the plant had occurred. Examination at this time of the mass of water contained in the tub showed that while the vital processes still went on they were more limited in extent owing to the progressive degeneration and death of the majority of the plant elements.

D. The study of the life history of the plant with its proper classification. The life history of this plant is probably as follows: Starting with the large circular oöspore seen in fig. 3, there is segmentation of its endochrome to form smaller cells which escape as motile zoöspores, becoming pyriform, oval, and finally fusiform in shape. The ends of these fusiform cells become rounded, their endochrome presents transverse markings, and they finally develop into the filamentous forms seen in

fig. 1. Certain of these filaments give rise to small motile antherozoids (fig. 6), while the endochrome of other filaments become differentiated into oöspores. These oöspores become germinated by contact and absorption of an antherozoid, escape by the rupture of the mucilaginous envelope of the filament and segment to give rise to the motile zoöspores heretofore mentioned.

While this plant undoubtedly belongs to the Spheropleæ, its exact name (if it possesses one) could not be determined. In many respects it resembles the Sphæroplea annulina, differing, however, in the following particulars: (1) By the absence of any vacuolated appearance in the filaments. (2) By the absence of the red oil seen in the matured oöspore of the latter plant, the small number of cells found having a reddish tinge not warranting this assumption. (3) By the absence of stellate forms in the oöspores.

The water supply of Alcatraz Island, Cal., brought by steamer daily from San Francisco, was reported in March, 1897, as having a decidedly disagreeable taste, a faint yellowish color, and a slight odor. This condition was said to be due to the presence of an alga, which the medical officer found to be present in the water as drawn from the main at the Clay street wharf.

PURE WATER FOR TROOPS ON ACTIVE SERVICE.

Maj. S. Q. Robinson, surgeon, in his report on the fevers of Fort Reno, Okla., pointed out a well-marked coincidence between the prevalence of fever and the amount of field service performed by the troops forming the garrison. (See supra p. 80.) This coincidence had already been noted in the experience of many of our army medical officers. Post surgeons in referring to the causation of low fevers in their commands have frequently taken occasion to explain that these did not originate in insanitary conditions at the post, but were incurred by the men while absent on field service. Dr. Smart discussed this subject in a letter, July 6, 1897, addressed to this office, and urged the use of portable filters for commands in the field as certain to lessen the number of such febrile cases. His personal experience on a march with Troop E, First Cavalry, in a country where the surface water supply is always bad, and at a time when it was at its worst, demonstrated the practicability of filtering water supplies for troops on field service. Favorable action was taken on Dr. Smart's communication, which was as follows:

I have the honor to invite attention to the advisability of providing portable water filters for troops operating in the field. Such commands are usually dependent on surface water supplies, and I take the position that surface water supplies are always dangerous. I desire to point out that in the early days of the settlement of our western country fevers were common, both in military commands and in civilian communities. These fevers were of an adynamic type. By some observers they were regarded as malarial remittents, by others as specific typhoid fevers, while others again, among whom was myself, considered that, although the majority of the cases were of malarial origin, occasional cases were due to the specific cause of enteric fever, either developed de novo or propagated from some previous case. Notwithstanding differences of opinion as to the nature of the fevers, there was a general belief that the water supply was concerned in their causation. This belief became strengthened as continued observation showed that these fevers diminished in prevalence both at military stations and in civilian settlements as purer water supplies were obtained. At the present time these fevers are of more frequent occurrence in military commands in the field than among the troops stationed at permanent posts, and in temporary civilian camps or growing settlements than among communities that have expended money in improving their water supplies.

The advisability of providing pure water for troops in the field as well as for those at permanent posts may be considered evident. The possibility of making this provision seems to have been hitherto an untried experiment, at least in this country.

Recently in field operations with Troop E, First Cavalry, in Oklahoma Territory, I desired, if possible, to preserve the men from disease due to impure water. The object of the field service was to test the value of the emergency ration. Obviously, this value could not be appreciated if the men under observation were to become

sick from influences other than those connected with their special diet. Diarrhea or fever caused by impure water might be attributed to dietetic causes, and so cast odium on the ration. Hence to give the ration fair play, it became a special object to provide the men with pure water. To this end I consulted Maj. Walter Reed, curator of the Army Medical Museum, who provided me with a filter which he had subjected to many severe bacteriological tests. This filter answered its purpose excellently. My experience with it showed the possibility of carrying on field service a machine which will supply a pure water for a company of troops from a foul stream or stagnant pond.

Since this can be done, I respectfully urge that it should be done; that a certain number of warranted filters should be kept available for the use of troops ordered to field duty.

The expense incurred in making this provision would be an economy to the Government, not only in saving the lives of good men, but in lessening the expenditure of money for pensions to men disabled or to the families of men dead from preventable fevers. There are men on the pension rolls now drawing $72 per month for disability due to typhoid fever, a disease which would not occur or which would be extremely rare, in commands in the field provided with an efficient filter.

It may be said that the expenditure for filters is unnecessary as the men can protect themselves by boiling the water. The men tried to do so, old soldiers particularly, and there is always in a troop or company enough of such veterans to leaven it and raise its younger members in the tried and accepted methods of avoiding insanitary conditions. The boiling resolves itself into making a weak coffee over night to fill the canteen for the next day's march; but it is not always possible to do this, or the canteen becoming empty is filled again on passing the next muddy stream or water hole.

I do not require to leave the neighborhood of Fort Sill, Okla., in which the test of the emergency ration was made, for an illustration of the harmful effects of impure water on troops in the field. Maj. E. T. Comegys, surgeon of that post, informed me officially that in June, 1896, Troop H, First Cavalry, 47 strong, formed the escorting party for money to be paid to the Indians on the reservation. Nine men of this command became affected with typhoid fever and two died, as the result of insanitary conditions on this trip. Troop E, First Cavalry, 46 strong including myself, rode over much of the same ground in May, 1897, and filtering our water supplies from the same creeks, returned to Fort Sill without a man sick. This alone, it seems to me, establishes the position which it is the object of this communication to sustain, the advisability of providing pure water supplies for troops in the field, since the recent expedition to test the value of the emergency ration has shown that it can be done.

FOOD.

The food of the men has been reported almost uniformly during the year as ample in quantity, well cooked, and of excellent quality.

Maj. H. Lippincott, surgeon, invited attention to the bad condition of the porcelain-lined dishes in the general mess hall at Fort Sheridan, Ill. He urged that they be disused as they were badly worn and chipped, and their cracks and crevices afforded hiding places for disease germs and the lodgment of dirt.

In December, 1896, a number of men at West Point, N. Y., suffered from symptoms of poisoning by some putrefactive change that had taken place in head-cheese supplied by the post butcher. Maj. George H. Torney's report of this was as follows:

On the night of the 21st instant, as already reported, 25 enlisted men of the cavalry detachment who had at supper on that date eaten head-cheese supplied by the post butcher, were poisoned by a toxic agent which probably originated in some putrefactive change in the food. In several of the cases the symptoms were very severe, while in others they were slight. But in every instance in which this food was eaten there was some manifestation of its toxic effect on the system. The recommendations made after the outbreak, that all foods containing pork, and especially partially prepared articles, be thoroughly cooked before being served to the messes, have been carried out. Fortunately no mortality resulted from this outbreak, and all the cases recovered within a period of a few days and were returned to duty.

At two posts the milk supply was criticised adversely. Major La Garde reported from Fort Robinson, Nebr., March 31, 1897, that the post dairy was not kept in a cleanly manner and that the milk collected

from such a source could not be clean. He urged that, for the privileges accorded, the keeper should be required to observe the sanitary rules for dairies that are in force in civil communities under the supervision of boards of health. An early inspection of the dairy with the enforcement of the necessary sanitary rules was ordered by the post commander.

In February last Capt. Charles E. Woodruff, assistant surgeon, made a careful inspection of the sources of the milk supply at Fort Sheridan, Ill., and discovered so many insanitary conditions in connection with the collection, storage, and distribution of the milk as to lead him to recommend a radical change in the method of milk supply.

He reported as follows:

The principal dealer in the post is A. His farm is northwest of the post, and is in fair condition. The water used in cleaning cans, etc., is from a cistern and also from a well not far enough removed from the barnyard. The barns are kept fairly cleaned, but are not properly arranged nor in good sanitation, and pigs are kept in the same building, and are very objectionable. Several of the cows have a skin affection resembling the "mange," and unless they are removed from the others it is sufficient cause to condemn all his milk. A sells milk in the mess hall, and after carting around the milk all day he removes the surplus to his depot and allows it to settle, selling the cream and returning the skimmed milk to his farm. This he now denies. This accounts for the fact that his cream is often unfit for use, souring in a foul manner indicative of dirty infection of the milk. In summer this is quite a frequent occurrence, as the milk is not kept cold enough. A has the usual vat for cooling the milk as soon as it is put into the cans, but the milk house was not neat and clean.

A buys extra milk from his neighbors, B and C. B's place is new, and well arranged except as to the water. The well, 40 feet deep, is a few feet from the barnyard, and, of course, contains seepage from the barnyard filth. The water is used for all purposes. It is not likely that it is contaminated from the privy which is quite a distance off, draining through a drainpipe in an opposite direction. Yet it is dangerous, and though no question of adulteration of milk with this suspicious water need be considered, it is possible for milk to be contaminated by careless splashing of water, or through rinsing of the cans. As there are no means of keeping the milk cold enough in the time intervening before it is delivered at the customers' houses, this is a very dangerous defect. The stable was found to be very filthy.

C's farm was established to supply pure milk to a hotel, which he owns and manages. The farm, barns, and creamery are almost ideal, the defects being of minor importance. The cows seem to be healthy, part of them being pure Swiss stock. The water is from an artesian well, 1,800 feet deep. The hotel takes almost all the milk, and there is not enough surplus to supply the post. The milk seems to be safe.

D, who sells milk in the mess hall, has but two cows, buying the rest of the milk he sells. One cow he keeps at home in a stable indescribably filthy. The other cow is kept at his father's farm adjoining, and it is in a similar state of filth. The water is from a well in an open field near by. The milk he buys is brought to the house in the morning, and is kept in the kitchen, the lids of the cans being often taken off. Here it remains until evening, in the meantime receiving dirt and anything else that may be dropped into it by the family, including eight children in their frequent comings and goings through the kitchen. From the general filthy state of house and surroundings it is not to be expected that any care is taken with the milk cans.

D buys milk from E, whose barns are not as dirty as D's, but bad enough. The well in the yard could easily become contaminated. The milk is put away in a small cellar, in which I saw an open swill barrel full of sour milk, a pork barrel half full, vegetables, partly decayed apples, and fresh meat. The place is dirty and the cows ill kept.

D also buys milk from F. Here there was a greater state of cleanliness and a closer approach to the dairy business, as this farmer has for many years been shipping milk to Chicago. There is a good, clean milk house surrounding the well, but it is too near the house for the water to be above suspicion. The barn was clean, but the cows are fed on sour, decayed malt from the city breweries.

G sells milk in the post and mess hall. His farm is unsanitary in the arrangements, but an attempt at cleanliness is observed. From the condition of dirt around the house it is not reasonable to expect proper care of the cans. There is no milk house, and the cans are kept in a presumably dirty house. It was not inspected. His cows being now dry, he buys milk from H, a near neighbor. H has never before sold milk,

though he has sold butter in the post for several years, and given satisfaction. The barn is in good condition, but the surroundings of the house are bad, all the kitchen slops being thrown out on the ground at the kitchen door. The well is near the barn, and the water is apt to be contaminated with seepage from the barnyard. He has lately erected an ice house and milk house combined. The vat for cooling the milk in summer is such as is usually found on dairy farms. The cellar in which the milk used to be kept is fairly clean, but in great disorder. There can be no assurance that the cans will be cleansed perfectly. Last winter diphtheria appeared in a house about a half mile from G's place, and the danger of its spreading to other houses is enhanced by the generally unsanitary state of all the neighboring houses.

I, who sells considerable milk, has the filthiest farm I have ever seen. Several of the cows have a skin affection resembling the "mange," and some of them look sickly. They are very dirty. They drink at what is called the "spring," a small pond in a semi-marshy place. It is covered now with ice which is flooded with water. The cows tramp through and deposit manure in it, so that they drink a yellowish solution of urine and manure. I buys garbage from the post mess for his hogs, but some of it is thrown on the ground and the cows were eating it. Notwithstanding the cold the stuff has decayed, and the whole place was filthy in the extreme. It must be frightful in summer. The stables are ramshackle affairs, unsanitary in arrangement, and filthy in the extreme. The water is from a cistern near the house, and is so dirty and filthy that it is actually brownish yellow in color. The water usually taken for the cleansing of cans is from a well near the barnyard, but it is temporarily out of use, the walls having fallen in. The milk house is near one of the filthy barns and is dirty. In summer it is said to be horribly foul. The cans are in many cases old and rusted, and could not be properly cleaned, even if the attempt was made. They are simply rinsed out with warm water. No care is taken of the cans; they lie around on the ground, some soiled, others rusted, and one full of frozen sour milk. All the surroundings of this place are indescribably filthy and disorderly, and the place has for years been looked upon as the worst filth spot within miles. I have frequently seen his milk cans taken out of the post on the garbage cart. There is no doubt that the possible dangers from using any milk from this farm are so great that it should be excluded from the post. I should not be permitted to enter the post for this purpose.

I buys milk from J's farm, which is northwest of the post. The barns are only fair as to cleanliness. The cows do not look well. A few have a "mangy" looking skin. The well is removed from the barnyard a fair distance.

All the men claim that they scald out the cans as soon as they are returned to the farm. This should clean them sufficiently if they can be trusted to do it every time, a rather doubtful supposition; but it does not sterilize the cans, and souring of the milk in warm weather or repeated infection of the milk is possible.

No case of sickness was heard of at any farm, and if any disease existed it was carefully concealed.

Some of the farmers made a pretense of washing the cows' nipples before milking, but the efficiency of the process can not be vouched for. As a rule, the cows were all in a filthy state, manure was found adhering to their sides and udders. This lack of care is in keeping with the generally dirty state of the barns and other surroundings. In many instances it was possible for the cows to feed on manure. None of the barns seemed to have been recently whitewashed, and some of them have perhaps never had such treatment.

Not one of the farmers seems to have an understanding of the proper management of the dairy business, and they do not appreciate the dangers. They are not dairy farmers, but poor men, with small, ill-kept, poor farms, in a marshy, unwholesome locality, who have taken to selling milk to eke out an otherwise poor living. Some of them are too poor to secure necessary appliances, and several seem too stupid to learn proper methods. It is doubtful whether a system of inspection under these circumstances can be made practicable. Where the daily life is such a dirty one, cleanliness in the milk business is not possible.

There was no investigation of possible adulteration with water, there being no way of proving the charge that such was done. The state of affairs found is bad enough, but would be much worse if the milk is watered with such impure water as must exist in the barnyard wells in these marshy places.

In marked contrast to the above, I respectfully submit the following synopsis of an investigation I made over a year ago of the fresh milk supplied to the post for a short time by a condensed milk company. The central plant is in a good grazing country, where model dairy farming can be carried on. The farmers are under contract to supply their whole product, and are well enough paid to be anxious to carry out the requirements. Their barns have to be whitewashed inside and out, and kept scrupulously clean. The cows are kept clean, properly bedded, and before milking the nipples are most carefully washed. Such foods as slops, soured malt from breweries, onions, etc., are forbidden. Veterinarians inspect the herds at frequent irregular

intervals, and on the least sign of disease the cow must be isolated and the milk thrown away. If necessary the cow is killed. The company's inspectors have duplicate keys to all barns and make frequent visits both day and night, and upon the least infraction of rules the contract is broken. The water supply and general sanitation of each farm are also looked after. The milk cans as soon as filled are placed in vats of ice water and slowly stirred until cooled, when they are immediately taken to the central plant. The milk is tested, and if below grade is rejected. The cans are emptied, cleansed and sterilized with live superheated steam, and returned to the farmer, who is forbidden to open the can except to put the milk in. He is not allowed to wash the cans, but is required to be scrupulously clean with the milk pails, paddles, etc. The milk is at once put into sterile bottles and hermetically sealed, and the bottles are packed in ice in boxes and placed in a cold-storage room. In the evening the boxes are transferred to refrigerator cars and sent to Chicago by special train, arriving at midnight. They are then taken to the three distributing depots and the delivery commenced at 4 a. m., less than twenty-fours after milking, less time than usual in the dairy business.

This care not only makes improbable the infection of the milk, and if it should be accidentally infected, it is kept so cold until actually delivered that the disease germs do not develop. As a result the tests of this milk have invariably shown it to be above grade, and containing a minimum of bacteria per cubic centimeter. It is so successful in Chicago that it is sold in immense quantities, notwithstanding its high price. In taste it was superior to any milk used in the post, was very well liked, and eminently successful. The exchange officer would not buy it because there was no profit, and the civilian who took charge of it afterwards dropped the matter for the same reason, though his business was growing and subsequently would have been very profitable. The railroad company brought it out for 1 cent a quart and returned the empties free. For special purposes, such as the mess of this post, the company delivers the milk in bulk, but usually refuses to do this, so as to give dishonest agents no opportunity of tampering with it, an impossibility with the sealed bottles. The company also runs some milk through the separator, selling the cream in half-pint bottles. The fresh condensed milk so highly recommended for infants is sold in half-pint jars. It will keep fresh several days. It is unsweetened, and is condensed from four times its bulk of fresh milk by evaporation in vacuum pans. Both are cared for exactly as the fresh milk. I have ordered this fresh condensed milk for sickly infants with poor digestion, and it has been eminently successful. It is a great misfortune that it is not now obtainable. This is all done in connection with their other business of condensing milk. The dairy business on modern scientific lines requires such scrupulous cleanliness to be successful that the company is quite anxious to have experts and the public in general visit and inspect the business in every detail. This is in marked contrast to I's reluctance to allow me to look over his filthy place.

Conclusions.—There is but little milk brought into the post which is wholly fit for human food, and should it ever become infected in summer time, a serious epidemic is liable to occur, owing to the rapid growth of germs in warm milk.

Such men as D, G, and I are dangerous, and should be positively prohibited from bringing milk into the post. Their farms can not be put in proper condition, and their methods of living show that they can not learn.

A might be trusted to remedy the defects of his place. The same might be said of H, but in each case it is doubtful if they could be made to understand the great care necessary to prevent infection. Their whole idea seems to be to keep the milk from souring until it is used. Such constant superintendence, inspection, and testing by experts is necessary, that I doubt whether it is practicable here, and the only thing to do is to recommend milk that is already tested, inspected, and supervised by experts. In addition, the marshy ground is unfit for dairy farming, the cows virtually living in the slough west of the post, and as none of the men have enough cows, they will constantly be introducing milk purchased from unsanitary, uninspected sources. It is far safer to exclude them all and keep our own cows, or buy certified milk from the company. This is entirely practicable if it is managed by the Exchange, the milk arriving on the 7.50 a. m. train and being distributed before 8.30 a. m. It will keep for two days, and the bottles need not be uncorked until put on the table, thus assuring no contamination in the transit.

If it is not practicable to have a wagon meet the 8 a. m. train to deliver the milk, it could come out on the 11.46 train, the commissary wagon taking it around the post.

Special rates are made for it if taken in bulk, and none other should be purchased by the general mess or permitted to be sold to soldiers.

If the above arrangements can not be made, then I would respectfully recommend that efforts be made to have built a large commodious cow barn, and that officers be permitted to keep cows, a herder being hired to look after them.

The emergency ration which was authorized by General Orders, No. 49, Headquarters of the Army, Adjutant-General's Office, Washington, D. C., December 5, 1896, was tested practically by Troop E, First Cavalry, under the medical supervision of Maj. Charles Smart, surgeon. The results of the ten days' march on emergency rations for five days, were in every way satisfactory as showing that there was no noticeable deterioration in the condition of the men on account of their hard service and limited diet. Dr. Smart's report, which discusses the whole subject thoroughly, is as follows:

Report of a practical test of the use of the emergency ration by U. S. troops on active service.—The emergency ration was authorized and announced in General Orders, No. 49, Headquarters of the Army, Adjutant-General's Office, Washington, December 5, 1896. These orders were based on the recommendations of a board of officers convened by Special Orders, No. 74, Adjutant-General's Office, March 28, 1896, of which board I had the honor to be chairman. The board was called upon to make recommendations on the subject of an emergency ration and to report upon the minimum amount of articles of food necessary to sustain a soldier in health and activity, while in active service in the field for a limited period. This at first sight seemed a great responsibility, but to aid it in its deliberations the board had the benefit of the well-considered views of no less than forty officers of experience, for in each of the eight military departments a board had already been convened, each consisting of one medical, one subsistence, and three line officers, and the reports of these boards, together with the views of the Commissary-General of Subsistence thereon, were among the materials submitted for the consideration of the War Department board aforesaid. The work of the eight departmental boards made that of the War Department board an easy one. The experience of the many officers constituting the various boards indicated so clearly the main points of consideration that the War Department board had before it little more than a work of verification. Practically, the result of its deliberations confirmed the average results reached by the departmental boards.

Certain propositions were accepted, as proved by the experience of the members. An emergency, for instance, is no time to attempt a change of diet; hence all special articles prepared with the utmost care to supply the system with the theoretical amount of the theoretically needful nutriments must be set aside and only those articles be recommended for issue to the use of which the soldier is accustomed. Again, an emergency might occur at any time and special rations might not be on hand when wanted; therefore the emergency ration should consist of those articles which the Subsistence Department would have always on hand for the subsistence of troops. In other words, hard bread, bacon, and coffee should form the staples of the emergency ration; and to insure that there should be no misunderstanding on this head, the board specified that the hard bread should be such as the Subsistence Department was then issuing for the use of troops, and a similar remark was made in regard to the bacon. Concerning the coffee there seemed to be no room for misunderstanding. Pepper and salt were recommended as condiments, and tobacco as an accessory which could not always be procured by private purchase in an emergency in war time. The only advanced steps taken by the board was the acceptance of saccharine instead of sugar, and for the weight of the sugar thus saved the substitution of a weight of soup-making material (pea meal being suggested provisionally) containing a large percentage of protein, as this seemed necessary on scientific or theoretical grounds to complete the proper dietary.

In the published articles on the subject, an emergency ration was assumed to be a minimum of diet, and the orders convening the War Department board appeared to imply the same view; but the board in its report made the unexpected proposition that this ration should consist of the maximum diet for hard labor. It was considered that there would be hard work ahead of troops ordered out on emergency service, and that therefore no restriction should, if possible, be placed on the amount of food available for the men. Emergencies would seldom last beyond a few days. The maximum diet for hard labor is set down by the scientific authorities at about 2 pounds. As the board considered that on an emergency the soldier could carry 10 pounds of food, it recommended that the ration should consist of 2 pounds, but that no more than five days' rations should be authorized to be carried. Thus, if the emergency should last less than five days, the soldier would always have the fullest diet to sustain him. This would provide for many of the emergencies of military service. But, on the other hand, should the emergency be expected to last for a longer period than five days? Here the board became confronted with the call to determine the minimum amount of food necessary to sustain a soldier in health and

activity for a limited period in active field service. Physiologists are well acquainted with what is called subsistence diet. It is the diet that is needful to carry on the internal work of the human system, the work involved in the mere act of living, without consideration for active, live, muscular work, productive of external results. This is usually set down as about 16 ounces of water-free food. Parkes, in his widely known work on hygiene, gives the weight of subsistence diet as 15 or 16 ounces, not including coffee in this weight, and he states that, although this will keep a man alive, it will probably not prevent him from losing weight, and therefore is not really sufficient.

In consideration of this minimum declared by the scientific and practical hygienists to be absolutely needful, the board decided that when an emergency occurred which was expected to continue for a longer period than five days, the command should be required to so use its five days' rations as to make them last for the expected number of days, but that ten days should be the limit of use of the five days' emergency rations, because when made to last for this number of days, the men would be practically living on the subsistence diet of the physiologists, and all muscular work productive of external results would necessarily be at the expense of their own tissues. It was conceived that emergencies would rarely last for so long a period as ten days, but that when such an emergency did occur, it would be one of extreme gravity and of such a character as to call for self-sacrifice on the part of the troops. That they would lose weight on such a spare dietary was accepted, but it was considered by the board, from the experience of its members, that troops could undergo ten days of active service on the limited ration without material loss of efficiency and with no more injury to the constitution of the men than could be repaired by a week or two of full diet when the emergency was at an end.

The quality of the components of the ration was decided upon so that while the whole ration should have the highest calorific value, its half should contain the proteids or nitrogenous principles of the physiologic subsistence diet.

It is needless to speak of the whole ration, its sufficiency being guaranteed by daily experience where hard bread, bacon, and coffee are used as food.

The ability of the soldier to pack on his person and carry five days' rations was a question to be determined by the experience of military men. The members of the War Department board concluded that it could be done, but left the details to be elaborated in the future. The report of Capt. W. C. Brown's test trip in Oklahoma Territory shows that the five rations, the required amount for an emergency of five or more days, can be carried by mounted men, and shows also what seems under present conditions to be the best mode of packing. Future experiments with infantry troops will determine this for them.

The sufficiency of the five days' rations, when spread over six or seven days, may also be taken for granted, but when spread over eight, nine, or ten days, when the physiologic subsistence diet was approached or reached, the practical question arose: Would the men be able to stand it? would they, having food in their possession, be able to limit themselves to a small regulation allowance, or would they satisfy the cravings of the day and let the morrow look to itself? This was the uncertain question that could be decided only by a practical test, not by one or two men, who might be enthusiasts, but by a military command composed of unselected men, many of whom should be young soldiers who had never undergone any privation or restriction of diet.

It fortunately happened that Lieut. W. C. Brown, who had been recorder of the War Department board, was shortly thereafter promoted to the captaincy of Troop E, First Cavalry, stationed at Fort Sill, Okla., and it occurred to this officer that from no other post in the United States could the sufficiency or the inadequacy of the emergency ration be demonstrated so satisfactorily, because on account of the absence of settlers on the Indian reservation a command could march for the required number of days without having to camp or to pass within 20 or more miles of any settlement where the troops might obtain any articles of food unknown to their officers. Captain Brown represented this to the Adjutant-General of the army, and requested permission to take his troop out to test the sufficiency of the ration when used for the maximum limit of ten days.

This permission was granted, and I was detailed by Special Orders, No. 87, Headquarters Army, Adjutant-General's Office, Washington, D. C., April 15, 1897, to accompany the command as its medical officer. The duty of a medical officer in this case involved more than the ordinary duty of a medical officer with an expeditionary column. It involved a special inquiry into the condition of the men as affected from day to day by the limited dietary.

To enable me to make this inquiry I joined the command at Fort Sill, Okla., several days before the troop started on its march. Through the courtesy of the Quartermaster-General's Office, I obtained a portable platform scale by which the weight of the men could be taken when desired. From the Army Medical Museum I procured two dynamometers, one of which determined the upward pull of the

men, the other the muscular power of their arms. It was not the intention to use both of these, but the average relation between them was determined so that if any accident destroyed the utility of the one in use, the other might be substituted and its results be comparable with those already made and recorded. The dynamometer which recorded the upward pull was used throughout the expedition, as its efficiency continued unimpaired. It was made by Tiemann, of New York, and consisted of an elongated oblong steel spring, with a dial plate and index to show in pounds avoirdupois the approximation of the sides of the oblong when under strain from below upward. To use it a strong iron hook was riveted into the center of a board 2 feet long by 1 foot wide and 2 inches thick. The soldier stood upon this board, one foot on either side of the hook. He then caught the lower end of the oblong spring in the hook, adjusted a crossbar by means of the links of a chain to the upper end of the spring, and then, with the crossbar in both hands, pulled upward with all his strength. The muscles of the legs, loins, back, shoulders, and arms were all concerned in this effort to pull the hook out of the board. From the Army Medical Museum I obtained also a portable filter, the capacity and efficiency of which had been under test for some time in the bacteriological laboratory. It was incumbent upon me, as upon all medical officers with troops, to protect the men from all unnecessary exposures to insanitary influences, but in this instance I regarded it as specially needful to take no risks from impure water. In another communication (letter to the Surgeon-General, dated July 6, 1897, supra, page —) I have dealt with this subject at greater length and made appropriate recommendations. Diarrhea from impure water occurring in the command would interfere with the special object of the expedition. Such diarrheas might even be attributed to the diet. To protect the emergency ration as well as to protect the men, I regarded it as essential to provide the command with pure water on the expedition, particularly as I understood that the surface waters of the region in which the march was to be made had a notoriously bad reputation. I was therefore gratified to find myself provided with a filter which had given satisfactory results in bacteriological experimentations.

During the few days of my stay at Fort Sill I examined the men who were to undertake the march and found them all sound and hearty. The party consisted of two officers and forty-four men. With the exception of the officers and six of the men, they were all under 30 years of age, the average age being $27\frac{5}{12}$ years. The youngest man was $21\frac{3}{12}$, the oldest, myself, $55\frac{6}{12}$ years. Twenty-two of the men were under 24 years of age, and most of these had never been on field service before. The average height was that of the American soldier, 67.5 inches, the extremes being 64 and 72 inches. The average weight was 158 pounds, the extremes 140 and 188.

In connection with this expedition the Surgeon-General of the Army suggested the desirability of making a control experiment by having a detachment of troops undertake a ten days' march on full field rations, that a comparison of the condition of the men in the two commands might be made at the end of their march. Only one officer, Lieut. William H. Osborne, and 9 men could be spared for this purpose. The average age of this party was $29\frac{8}{12}$ years, the extremes being $21\frac{9}{12}$ and $44\frac{5}{12}$; height, 67.9 inches, the extremes 65.75 and 71.5; weight, 163.4 pounds, the extremes 135 and 182 pounds.

The two commands marched from Fort Sill on the morning of Monday, May 17. They were accompanied by a wagon carrying rations for the men and grain for the horses, as it was the intention to keep the men on field service on full rations for two or three days before beginning the emergency march, the better to simulate the conditions that would be present in a case of actual emergency.

It will be observed from Table A appended[1] that the command as a whole lost weight during the two days' preliminary march while on full field rations, which loss must be attributed to the change from the quietude of garrison duty to the activity of field service. On the evening of May 15, the command of 46 officers and men weighed at Fort Sill 7,275 pounds, and on the evening of May 18, after two days' march their weight was 7,217.5 pounds, a loss of 57.5 pounds, or an average of 1.25 per man; but the loss was not thus evenly distributed, for seven men gained 10 pounds, or 1.43 pounds per man; nine remained unaltered in their weight, and thirty incurred a loss of 67.5 pounds, or 1.9 pounds per man. Four men lost 0.5, three 1, six 1.5, five 2, three 2.5, two 3, three 3.5, one 4, one 4.5, one 5, and one 6 pounds.

Of those who gained, 3 were light weights, 1 average and 3 heavy weights, the greatest gains being 2 pounds by a man who weighed at starting 138 pounds and 3 pounds by 1 who weighed 171 pounds. These 2 men were respectively 64 and 72 inches in height. Five were under and 2 over 30 years of age.

The men who neither gained nor lost varied from 144 to 166.5 pounds, in height from 64.25 to 70 inches, and in age from $22\frac{7}{12}$ to $30\frac{5}{12}$ years, but 5 of them were under 23 years of age.

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[1] It was not considered necessary to publish Dr. Smart's tables, as he summarizes all the data in the text of his report.

The 30 men who lost weight were men who weighed from 140 to 188 pounds. They varied in height from 64 to 70.25 inches and in age from $21\frac{3}{12}$ to $55\frac{8}{12}$ years.

During this preliminary march members of the detachment intended for the control experiment were somewhat similarly affected in their weight. Of the 10 in the party, 3 gained an aggregate of 4 pounds; 2 neither gained nor lost, while 5 lost an aggregate of 6.5 pounds.

On the morning of Wednesday, May 19, the detachment forming the control experiment moved out on its ten days' march with its field rations on pack mules. After the departure of this detachment the emergency rations were distributed from the wagon, which was then dispatched to Fort Sill, leaving the command with no transportation except two mules, on which were packed the platform scales, dynamometers, and filter, and a box containing a reserve supply of rations in case of the insufficiency of the official rations issued to the command. It may here be observed that there was no occasion to make use of these extra rations. The box was opened on the return of the command to Fort Sill to verify its contents and show that they had been untouched during the progress of the expedition. Each member of the command, officers included, then packed his rations in his haversack and saddlebags. In the bottom of the haversack were placed the coffee, saccharin, pea meal, salt, and pepper, with two 16-ounce boxes of hard bread on top. The bacon, wrapped in parchment paper, with one box of hard bread and the meat can, were placed in the near saddlebag; the two remaining boxes of hard bread, with towel, soap, etc., in the off saddlebag, the cup on the rear strap of the near saddlebag and the canteen on the off cantle ring. The command then mounted, and the trial of the emergency ration was begun.

The average daily march of the troop was about 21 miles. The men could easily have made longer marches, but long marches would have been a test of the endurance of the horses rather than of the men. As it was, the men of the troop, through the untiring energy of their captain, were kept actively engaged either on the march or in camp from reveille until taps. Breakfast consisted of coffee, hard bread, and bacon. Some of the men prepared soup over night, so that it required merely to be warmed up in the morning for breakfast. A few crackers, with some coffee or pure water from the canteen, made a satisfactory lunch, taken either during a halt on the march or immediately after reaching camp. Dinner or supper after stables constituted the meal of the day. Soup was always prepared at this time. Soldiers in frying bacon in the field run about two-thirds of the food material to waste. As the fat melts from the bacon in the pan in the process of frying, they tilt it into the fire, and the resultant piece of crisp, fried bacon weighs less than a third of the uncooked slice. Many of the men economized their bacon by frying their hard bread, previously softened in cold water, in the melted grease. I am aware that this practice is denounced by most authorities on dietetics, but I have yet to discover any harmful effect from this method of cooking either among healthy young soldiers or hardy old soldiers. Others utilized the whole of their bacon by chopping it into small fragments and boiling it with the pea-meal soup. In this way none of the fat was lost.

Inspection of rations was held on alternate days to check any tendency to an extravagant use of supplies. As a rule, the men were careful and seldom had to be cautioned as to the shortage of any article of the ration. Under the conditions of this march there was no possibility for the men to procure, unknown to their officers, any addition to the food supply carried in their haversacks and saddlebags. On actual service the diet of the command could easily have been increased by killing large game, but as the object of the expedition would have been frustrated by any addition to the ration, no effort was made in this direction. The men recognized this, and on one occasion, when a few mulberries were found in camp, the men made inquiry as to whether they could eat them without interfering with the experimental trial of the ration. On another occasion some wild onions were dug up at a halting place and brought into camp to season the pea-meal soup. These were the only additions to the ration which a few of the men had during the ten days' march. They were sapid substances and antiscorbutic, but as a food supply the weight used amounted to nothing.

During the march the men were bright, active, cheerful, and appeared to suffer in no way from their restricted diet. Every evening before stable call the command reported in blouse, campaign hat, and leggins to be weighed. Each took an interest in this process, and the weight recorded was usually verified by the man himself before he stepped from the scales. A similar interest was shown in the test of strength by the dynamometer. On several occasions the pulse rate was taken before the men were weighed. The intention was to have the heart-beat noted while the men were standing at ease, but it was not possible to get this in all cases; some of the men, just having been relieved from herd guard or other duty, had the pulse accelerated by exercise. During the first seven days the weather was dry and favorable to accuracy in weighing. Heavy rains fell on the eighth and ninth days of the march. The weight of the men was taken on the eighth day, May 27, but the results were of

no value, as they merely showed approximately how much moisture there was in the clothing. The evening of May 28 was so wet that the scales were not unpacked. The wet weather of these two days showed how fortunate the expedition had been during the first seven days. Damp weather during the trip would have rendered accuracy in weighing impossible, for moisture in the clothing would have obscured the slight changes in weight from day to day.

The wear and tear of the human machine in keeping up the vital processes and maintaining the animal heat at its normal requires the expenditure of an amount of energy which has been variously stated by different authorities. Probably the lowest estimate of what is needful as subsistence diet is that given by Playfair, who calls for 14.5 ounces of water-free food, the proximate principles being protein 2 ounces, fat .5 ounces, and carbohydrates 12 ounces, furnishing to the system 137 grains of nitrogen and barely 3,000 grains of carbon, and having an energy equal to 1,758 calories.

The half ration or daily allowance of food used by the command on its recent march consisted of 8 ounces hard bread, 5 ounces bacon, and 2 ounces pea meal, with coffee, saccharin, salt, pepper, and tobacco. Excluding the accessories and calculating the staples into their proximate principles, they are found to be composed of protein 2.128 ounces, fat 3.809 ounces, and carbohydrates 6.93 ounces, a total of only 12.867 ounces of water-free food. This allowance is considerably less than Playfair's minimum, but its reparative and calorific values are much greater. It furnishes 147 grains of nitrogen for the reparation of muscle, 3,159 grains carbon for respiratory purposes, and provides the system with an energy equal to 2,055 calories.

In accordance with the views of the authorities on dietetics, it was to be anticipated that men on a diet of this kind would not only lose weight by having to utilize the carbon of their tissues, but would lose strength also on account of an insufficiency of nitrogen to repair muscular waste. It is generally accepted that on active service men should have at least 300 grains of nitrogen daily to provide for the repair of muscular tissues. Parkes mentions the experiments, but does not detail them, of a British medical officer in India who found that men lost weight on active service when supplied with less than this quantity of nitrogen.

With the exception of a few ounces of pea meal, the whole of the five days' emergency rations was consumed by the expeditionary command, and it may be accepted that each man disposed of his own allowance. To go into detail would show that two or three of the young men had to be helped out by a handful of hard bread or a slice or two of bacon from some older comrade, that salt and pepper were in excess, and that saccharin was thought little of by many who liked their coffee just as well without as with any sweetening either of sugar or saccharin. It is to be observed that saccharin has no food value, and this appeared to be appreciated by the men. There was an excuse for the few men who had to go a little short on bacon during the last day or two, in that this article of the ration had been issued in 50-ounce blocks, and it required an accurate eye to slice off the proper allowance for breakfast or dinner in the early days of the march. Had it been issued in five pieces of 10 ounces each, the young soldier would have been better able to recognize his daily allowance.

The loss of weight incurred by the command during the ten days' march on the limited ration was 135 pounds, or an average of 2.935 pounds per man. On May 18, the aggregate weight was 7,217.5, and on May 29, 7,082.5 pounds. But the loss was not evenly distributed. In fact, 5 individuals, including the commanding officer of the troop, gained in weight an aggregate of 7.5 pounds, and 2 men neither gained nor lost, so that a loss of 142.5 pounds was incurred by 39 men, or 3.654 pounds per man. This loss was as follows:

Number of men.	Loss in pounds per man.	Aggregate.	Number of men.	Loss in pounds per man.	Aggregate.
2	8.5	17.	4	3.	12.
3	7.	21.	3	2.5	7.5
1	6.5	6.5	1	2.	2.
3	6.	18.	5	1.5	7.5
1	5.5	5.5	5	1.	5.
2	5.	10.	2	0.5	1.
4	4.5	18.			
2	4.	8.	39		142.5
1	3.5	3.5			

On looking at Table A, which records the weighings made day by day in the field to determine whether gain or loss of weight was influenced by age, it is readily seen that the men who suffered the greatest loss were mostly young soldiers. Of the six who lost from 6.5 to 8.5 pounds only one was over $22\frac{A}{11}$ years of age, while those who gained in weight were much more advanced in years; but, on the other hand, two of

five men who lost only 1.5 pounds were under 22 years of age, and one of those who neither gained nor lost was only 22½ years. The relation of the loss to age may be shown best by aggregating the men into three groups—those under 24, those between 24 and 30, and those over 30 years of age. Twenty-two were under 24, and these lost 87 pounds or an average of 3.95 per man. Fifteen were between 24 and 30, and these lost 41.5 pounds, reduced to 40 pounds by a gain of 1.5 pounds on the part of two of their number, equaling an average loss of 2.66 per man. Nine men were over 30 years, and their loss was 14 pounds, reduced to 8 pounds by a gain of 6 pounds on the part of three of their number, equaling a loss of .89 pounds per man.

The relation of height to the gain or loss is not so clear, but it would seem that the tall men lost less than those who were under the average in height. None of the eight men who lost 6, 7, and 8.5 pounds each was over 67 inches, but inasmuch as those who gained were also under the average height it is to be concluded that other conditions were much more powerful in their influence. Nevertheless when the men are divided into two classes those under 68 inches and those over that height, it is found that the former suffered the greater loss. Twenty-five men were under 68 inches in height, and these lost 84 pounds, reduced to 77.5 pounds by a gain of 6.5 pounds on the part of four of their number, equaling an average loss of 3.10 pounds. Twenty-one men were over 68 inches in height, and these lost 58.5 pounds, reduced to 57.5 pounds by a gain of 1 pound on the part of one of their number, equaling an average loss of 2.74 pounds for the class.

Height and weight do not always go together, else the heavier men would have lost less than the lighter men, but, as a matter of fact, the heavier men lost relatively more than the lighter men. On starting from Fort Sill the mean weight was 158 pounds. Dividing the men into two groups, those above and those below this weight, it may be seen that in the former were 22 men and in the latter 24. The 22 men above the mean weight, aggregating 3,750 pounds, lost 83 pounds, or 2.21 per cent, equaling 3.77 pounds per man. The 24 men under the mean weight, aggregating 3,525 pounds, lost 59.5 pounds, reduced to 52 pounds by a gain of 7.5 on the part of 5 of their number, equivalent to a loss of only 1.48 per cent or an average of 2.17 pounds per man. The mean height of the 22 men was 68.9 inches; their mean weight, 170.5 pounds. The mean height of the 24 men was 66.25 inches; their weight 146.66 pounds.

Whatever may have been the influence of age, height, and weight on the loss of weight of the individual soldier, it is certain that the manner in which the men cooked their bacon was an important factor in the case. It is to be regretted that careful observations were not made daily on this point. Every evening the officers of the command inspected the cooking processes at the various camp fires to show their interest in the welfare of the command, but no record was kept of each man's daily cooking. The majority of the men fried their bacon and lost two-thirds of the fat of the slices thus cooked. Some occasionally fried their hard bread in the melted fat and thus utilized a considerable quantity of it, and when they boiled the chopped bacon in their can of pea soup, the whole of the fat was saved and ingested. These differences in the method of cooking made it evident that, although each man had 50 ounces issued to him and was reported as having consumed the whole of it, the men individually took into their systems very different quantities of that part of their ration which had the highest calorific value. Captain Brown, for instance, obtained the full value of his ration of bacon by using it all in soup, while I lost much of mine by having it all fried to a crisp. He gained in weight; I lost. We were nominally on the same ration, but actually used very different quantities of hydrocarbon. It may be assumed that the other members of the command gained or lost more or less, in accordance in part with their method of cooking their bacon.

The ration prescribed by the hygienic authorities for a soldier undergoing hard labor in the field consists of from 25.5 to 29.5 ounces of water-free food, as compared with 12.86 ounces used by the men of E Troop, First Cavalry, on this expedition. It was therefore to be expected that the command would lose weight, but the facts that five gained in weight, that two neither gained nor lost, that the average loss in 27 of the 46 men did not exceed three pounds, and that in 36 of the 46 it did not exceed 5 pounds, although not all of the bacon was utilized, show that the estimates of the hygienists are on the side of liberality, and that men can do hard work and be in fine atheletic condition for at least ten days on a much less generous dietary. It is to be observed also that not all of the loss of weight is to be attributed to the shortage of food, for the ten men of the control experiment lost weight, although they had all they desired to eat, and in fact turned in a certain percentage of their rations on their return to Fort Sill. Their allowance per man per day was 12 ounces bacon, 11.2 hard bread, 5.4 flour, 2.4 beans, 1.2 sugar, and 16 potatoes with coffee, salt, and pepper. Their mess was a common mess, and out of this each man ate as much as he desired. They turned in on their return 11.2 pounds bacon, 3 pounds hard bread, 20 pounds flour, 10 pounds beans, and 1.5 pounds sugar. The average quantity consumed daily per man was 10.2 ounces bacon, 11.2 hard bread, 2.2 flour,

.8 beans, 16 potatoes, and .95 sugar. This average was equivalent to a total per man of 26 ounces of water-free food, consisting of protein 3.32 ounces, fat 7.68 ounces, and carbohydrates 15.0 ounces. It furnished about 230 grains of nitrogen, 6,377 grains of carbon, and an energy of 4,145 calories. Some of the men consumed more, some less, but all had as much as they cared to eat. Nevertheless the detachment lost 13.5 pounds in weight, an average of 1.35 pounds per man during the ten days. Four gained in weight, the largest gain being 4.5 pounds; six lost, the largest loss being no less than 7 pounds.

In this may be seen an alteration to a normal relation of fat to muscle in the individual soldier under conditions of active field service as compared with conditions of garrison duty. This must be taken into consideration in appreciating the maximum losses and gains of the 46 men of the emergency march.

It was feared that the deficiency of nitrogen in the half ration of the men in the emergency command would sap their strength by defective repair of muscular tissue, but this fear was not realized, for the daily tests with the dynamometer showed that there was no falling away in strength. In fact the command as a whole gained in upward pull 1,079 pounds during the ten days from May 18 to May 29, an average gain of 24 pounds per man. In Table A appended the dynamometer records of May 18 and 29 only are submitted, but the notes of each day's pull are matter of official record, which can be furnished if desired. The pull of the men of the control experiment was increased by 32.8 pounds per man, but when the difference between 12.86 ounces and 26 ounces of water-free food per day for ten days is considered, this increase in the muscular pull of the individual must be regarded as inconsiderable.

It will be gathered from what I have submitted above that I regard the value of the emergency ration as proved, even when used to its maximum limit of ten days, not only by veteran troops but by young and untried soldiers. On the forenoon of their return to Fort Sill, Troop E, First Cavalry, was in better training and athletic condition than when it rode out twelve days before; and as I am confident that I myself could have started out that day and repeated the ten days' experiment, so am I confident that every soldier in the troop could have done so.

As the results of this experimental expedition have proved so satisfactory, I see no reason why troops should not be accustomed to the use of the emergency ration, when out from their permanent stations on practice marches and field maneuvers. The experience would be as valuable as any other experience to be gained on such occasions.

It would be particularly valuable to company officers who would have in the actual emergencies of war to look after the individual cooking and the condition of the men's haversacks from day to day. I need say nothing of the demonstrated practicability of the emergency ration from the military point of view. The advantage of having a cavalry or infantry command able to cut loose from transportation for ten days and take up an unexpected position or make an unexpected attack is self-evident; but such movements can be better effected if the men, and particularly the officers, have had some experience in carrying out their details. The desirability of sending out emergency commands during autumn maneuvers and practice field operations is therefore manifest. But under existing orders this can not be done. General Order No. 49, Headquarters of the Army, Adjutant-General's Office, Washington, D. C., December 5, 1896, establishing the emergency ration, was issued under the dominance of theoretical views as to the insufficiency of this ration on half allowance. It prescribed that "the ration be resorted to only on occasions arising in active operations, when the use of the regularly-established ration may be impracticable, and that although the nutritive qualities of the ration permitted its use on half allowance it will not be so used except in cases of overruling necessity." I would therefore suggest that the said requirements be omitted from paragraph 2 of General Order No. 49, and that the paragraph be modified so as to read:

"2. The Secretary of War directs that the emergency ration will never be used for a longer period than ten days, and that not more than five days' rations be carried on the person at one time."

CLOTHING.

Little has been said by medical officers during the past year in criticism of the clothing issued to the men.

Dr. A. C. Girard, in May, 1897, considered that shoes are often selected by the men and worn so short as to cause ingrowing toe nails and inflamed corns. He suggested that the foot wear of the men be under the personal supervision of company commanders. On the enlistment of a man the company shoemaker should measure the man's foot and a record be kept of this measurement, and in drawing shoes this

measure should be adhered to. Commenting on this, Colonel Woodhull, chief surgeon of the department, remarked:

The action recommended and taken in relation to shoes is both wise and important. An infantry officer should take the same care of his men's feet as a cavalry officer does of his horses' feet; but generally the men's feet are neglected and the results described follow.

Two medical officers invited attention to the danger of catching cold by thoughtless or unnecessary exposures to the weather. At Fort McHenry, Md., Maj. C. K. Winne reported, in December, 1896:

It is suggested that battery commanders impress upon the men the danger due to exposure when insufficiently clad. Men often leave the barrack rooms in their shirt sleeves. Avoidance of this habit would insure comparative immunity from sore throats and other more serious diseases.

At Fort Douglas, Utah, February, 1897, on the recommendation of the surgeon, orders were given for the men to wear overcoats and overshoes during the cold weather when outside of their quarters.

BATHING.

A great deal has been done in the past few years to improve the facilities of the men for bathing, so much so that during the past year only one post, Fort DuChesne, Utah, has attracted attention in this regard. The want of an efficient system for distributing the water which is stored in water barrels in the kitchens is no doubt the principal reason why facilities for personal cleanliness at this post are so meager. Lieut. Chas. E. B. Flagg, assistant surgeon, reported, January, 1897:

Bathing facilities at this post are unsatisfactory; ordinary washtubs are used, a hip-bath tub and a foot tub for one troop, and one half barrel for the other. In one troop the water is heated by means of a heating stove and copper boiler and a caldron stove. In the other, the water is heated in three oil cans on a heating stove. The system is not conducive to cleanliness.

Lieut. Col. A. A. Woodhull, deputy surgeon-general, adds:

This shows a lamentable deficiency in opportunity for bathing in a command whose race peculiarities demand unusual facilities for the preservation of cleanliness. The bath houses should be heated in cold weather, and this can easily be done in connection with the rain bath herein advised, the whole at a very low cost. The method of equipping such a bath house is clearly explained and illustrated on page 10, Circular 8, Surgeon-General's Office, May 1, 1875. It is recommended that the Quartermaster's Department be directed to erect this inexpensive plant at Fort DuChesne for each troop without unnecessary delay.

STATISTICAL TABLES.

The following statistical tables give in detail the data on which the statements of this report are based. They are:

I. Numerical view of the effects of disease and injury on the Army during the calendar year 1896 as compared with the corresponding data for 1895 and for the decade 1885–1894.

II. Relative sickness among the troops (white and colored) in the various military departments in 1896.

III. Military posts in each department, alphabetically arranged, with mean strength and admissions for disease and injury; also discharges and deaths, with ratios per thousand of strength for admissions and noneffectiveness, the average of daily sickness, and the meteorological data for 1896.

IV. General view of the results of disease and injury at each of the military stations, arranged in the order of their mean strength.

V. Twenty posts having the highest admission rates for the year 1896; also their admission rates for the years 1891–1895, inclusive.

VI. Twenty posts having the lowest admission rates for the year 1896; also their admission rates for the years 1891–1895, inclusive.

VII. Twenty posts having the highest noneffective rates for the year 1896; also their noneffective rates for the years 1891–1895, inclusive.

VIII. Twenty posts having the lowest noneffective rates for the year 1896; also their noneffective rates for the years 1891–1895, inclusive.

IX. Twenty posts having the highest admission rates for disease, excluding venereal diseases, vaccinia, and alcoholism; also their ratios for deaths, diseases, and constant sickness, and the corresponding average rates for the Army, year 1896.

X. Twenty posts having the highest noneffective rates for disease, excluding venereal diseases, vaccinia, and alcoholism; also the average number of sick daily, the average duration of each case, and the corresponding average rates of the Army, year 1896.

XI. The military posts in each department showing the rates of admission, death, discharge, and noneffectiveness for disease, excluding venereal diseases, vaccinia, and alcoholism, year 1896.

XII. Ratios of admission to sick report, discharge, death, and constantly noneffective of the Army and of the troops in the several departments for the year 1896 as compared with the rates for the Army for 1895 and for the decade 1885–1894.

XIII. Distribution of certain important diseases at United States military posts in 1896.

XIV. Twenty posts giving the highest admission rates for malarial diseases, rheumatism, diarrheal and venereal diseases, respectively, in 1896.

XV. Twenty posts giving the highest noneffective rates for malarial diseases, rheumatism, diarrheal and venereal diseases, respectively, in 1896.

XVI. Prevalence of alcoholism at the various posts and its influence on the effective force of the garrisons, year 1896.

XVII. The relations of certain diseases and classes of disease to the several arms of the service, and to the age, nativity, and length of service of individuals in average annual rates per thousand of mean strength for the period 1890–1896, inclusive.

XVIII. Number of white and colored applicants for enlistment, physically examined during the year 1896, with the number accepted, rejected on primary examination and declined, and the rates per thousand, year 1896.

XIX. Nativity of white and colored recruits accepted in 1896, with ratios per thousand accepted.

XX. Causes of rejection on primary examination among 14,659 recruits physically examined in 1896, with corresponding ratios per thousand.

XXI. Average height, weight, and chest measurement of 8,654 recruits accepted in 1896.

INTERNATIONAL TABLES.

I. Examination of recruits, 1896.

II. Movements of sick, by military departments, absolute numbers, and ratios.

III. Movements of sick by arm of service and by months.

IV. Movements of sick by larger garrisons.

V. Prevalence of important diseases.

VI. Admissions of important diseases by arms of the service.

VII. Admissions of important diseases by months.

VIII. Deaths according to years of service and age.

TABLE I.—*Numerical view of the effects of disease and injury on the Army during the calendar year 1896 as compared with the corresponding data for 1895 and for the decade 1885–1894.*

United States Army.	White.	Colored.	Total.
Average strength shown—			
By returns of Adjutant-General	a 24,977	a 2,206	a 27,183
By reports of Medical Department	b 23,014	b 2,105	b 25,119
Total admissions to sick report	26,063	1,829	27,892
Per 1,000 of mean strength	1,132.49	868.88	1,110.39
Per 1,000 for previous year	1,127.05	915.88	1,110.22
Per 1,000 for preceding decade	1,277.46	1,368.64	1,284.95
Admissions for disease	19,540	1,325	20,865
Per 1,000 of mean strength	849.05	629.45	830.65
Per 1,000 for previous year	852.99	659.03	837.53
Per 1,000 for preceding decade	1,031.57	1,072.25	1,034.00
Admissions for injury	6,523	504	7,027
Per 1,000 of mean strength	283.44	239.43	279.75
Per 1,000 for previous year	274.07	256.84	272.69
Per 1,000 for preceding decade	245.89	296.39	250.95
Admissions treated in quarters	9,014	620	9,634
Per 1,000 of mean strength	391.67	294.54	388.53
Admissions treated in hospital	15,938	1,188	17,126
Per 1,000 of mean strength	692.53	564.37	681.79
Admissions treated in the field	1,111	21	1,132
Per 1,000 of mean strength	48.27	9.98	45.07
Number constantly noneffective	799.05	54.19	853.24
Per 1,000 of mean strength	34.72	25.75	33.97
Per 1,000 for previous year	34.54	26.40	33.89
Per 1,000 for preceding decade	40.99	40.27	40.92
Days lost on account of sickness	292,452	19,835	312,287
For each man of Army	12.71	9.42	12.43
For each man, previous year	12.61	9.64	12.37
For each man, preceding decade	14.96	14.70	14.93
Average days each case was treated	11.22	10.84	11.19
For previous year	11.18	10.52	11.14
For preceding decade	11.76	11.00	11.69
Average days' treatment for patients returned to duty	9.68	9.26	9.65
Average days' treatment for patients discharged for disability	95.97	110.52	97.18
Average days' treatment for patients who died	17.14	22.94	17.77
Discharges for disability, all causes	253	23	276
Per 1,000 of mean strength	10.13	10.43	10.15
Per 1,000 for previous year	9.51	5.03	9.15
Per 1,000 for preceding decade	21.74	21.82	21.77
Discharges for disease	201	20	221
Per 1,000 of mean strength	8.05	9.07	8.13
Per 1,000 for previous year	7.16	2.74	6.81
Per 1,000 for preceding decade	18.23	18.18	18.26
Discharges for injury	52	3	55
Per 1,000 of mean strength	2.08	1.36	2.02
Per 1,000 for previous year	2.35	2.29	2.34
Per 1,000 for preceding decade	3.51	3.64	3.51
Deaths from all causes	132	16	148
Per 1,000 of mean strength	5.28	7.25	5.44
Per 1,000 for previous year	5.25	4.12	5.16
Per 1,000 for preceding decade	7.32	8.53	7.51
Deaths from disease	94	10	104
Per 1,000 of mean strength	3.76	4.53	3.83
Per 1,000 for previous year	3.62	2.74	3.55
Per 1,000 for preceding decade	4.97	6.00	5.10
Deaths from injury	38	6	44
Per 1,000 of mean strength	1.52	2.72	1.62
Per 1,000 for previous year	1.63	1.37	1.61
Per 1,000 for preceding decade	2.35	2.53	2.41

a Used in computing the ratios of discharges and deaths for the Army.
b Used in computing all ratios for the Army except those of discharges and deaths.

TABLE II.—*Relative sickness among the troops (white and colored) in the various military departments during the year 1896.*

Department.	Mean strength of command.	Admissions.						Admission rate per 1,000 of mean strength.	Constantly nonef-fective per 1,000 of mean strength.
		Quarters.	Hospital.	Field.	Disease.	Injury.	Total.		
East:									
White only	7,980	3,264	6,239	443	7,812	2,134	9,946	1,246.37	33.65
Missouri:									
White only	4,298	2,233	2,562	185	3,575	1,405	4,980	1,158.68	37.23
Dakota:									
White	1,381	524	636	53	903	310	1,213	878.35	34.41
Negro	1,061	161	515	21	487	210	697	656.93	23.11
Total	2,442	685	1,151	74	1,390	520	1,910	782.15	29.50
Platte:									
White	2,067	676	1,783	58	1,832	685	2,517	1,217.71	35.03
Negro	462	222	303	.....	373	152	525	1,136.36	30
Total	2,529	898	2,086	58	2,205	837	3,042	1,202.85	34.11
Texas:									
White only	1,725	823	1,206	47	1,564	512	2,076	1,203.48	36.41
Colorado:									
White	2,492	330	1,862	134	2,054	772	2,826	1,134.03	33.81
Negro	580	237	370	.....	465	142	607	1,046.55	24.81
Total	3,072	1,067	2,232	134	2,519	914	3,433	1,117.51	32.11
California:									
White only	1,539	244	745	184	837	336	1,173	762.18	24.02
Columbia:									
White only	1,491	417	889	7	945	368	1,313	880.62	28.78
General hospital, Hot Springs, Ark.:									
White	41	3	16	.....	18	1	19	463.41	.....
Negro	2	.....	.....	.....	.....	.....	.....	.....	.....
Total	43	3	16	.....	18	1	19	441.86	.....
Discharges and deaths at large:									
White only	.....	.....	.....	.....	.....	.....	.....	.....	.....
The Army:									
White	23,014	9,014	15,938	1,111	19,540	6,523	26,063	1,132.49	34.72
Negro	2,105	620	1,188	21	1,325	504	1,829	868.88	25.75
Total	25,119	9,634	17,126	1,132	20,865	7,027	27,892	1,110.39	33.97

TABLE II.—*Relative sickness among the troops (white and colored) in the various military departments during the year 1896*—Continued.

Department.	Deaths.	Annual death rate per 1,000 of mean strength.	Discharges for disability.	Annual discharge rate per 1,000 of mean strength.	Average duration of treatment among patients— Who died.	Average duration of treatment among patients— Who were discharged for disability.	Death rate per 1,000 of admissions.	Discharge rate per 1,000 of admissions.	Recoveries per 1,000 of admissions.	Average sick daily.	Average duration of treatment among all admissions.
East:											
White only	39	4.89	66	8.27	25.15	80.58	3.92	6.64	971.95	268.49	9.88
Missouri:											
White only	27	6.28	47	10.93	24.19	100.66	5.42	9.44	962.04	159.98	11.76
Dakota:											
White	7	5.07	19	13.76	5.14	88.37	5.77	15.66	959.60	47.52	14.34
Negro	5	4.71	11	10.37	24.20	109.73	7.17	15.78	951.22	24.52	12.88
Total	12	4.91	30	12.29	13.08	96.20	6.28	15.71	956.55	72.05	13.81
Platte:											
White	9	4.35	17	8.22	12.00	97.41	3.58	6.75	972.19	72.41	10.53
Negro	6	12.99	6	12.99	2.33	67.67	11.43	11.43	971.43	13.86	9.66
Total	15	5.93	23	9.09	8.13	89.65	4.93	7.56	972.06	86.27	10.38
Texas:											
White only	16	9.28	19	11.01	18.88	120.84	7.71	9.15	970.14	62.81	11.07
Colorado:											
White	14	5.62	32	12.84	6.79	100.62	4.95	11.32	956.48	84.25	10.91
Negro	5	8.62	4	6.90	46.40	38.00	8.24	6.59	975.30	14.39	8.68
Total	19	6.18	36	11.72	17.21	93.67	5.53	10.49	959.80	98.64	10.52
California:											
White only	6	3.90	11	7.15	6.83	79.09	5.12	9.38	959.08	36.97	11.54
Columbia:											
White only	3	2.01	11	7.38	2.67	90.00	2.28	8.38	964.97	42.91	11.96
General Hospital, Hot Springs, Ark:											
White	1	.....	16	.....	39.00	270.85	.....	.....	.....	23.69	.....
Negro	.....	.....	2	.....	.....	388.50	.....	.....	.....	1.43	.....
Total	1	.....	15	.....	39.00	286.53	.....	.....	.....	25.12	.....
Discharges and deaths at large:											
White only	10	.....	18	.....	.....	.....	.....	.....	.....	.....	.....
The Army:											
White	132	5.28	253	10.13	17.14	95.97	5.06	9.71	965.19	799.05	11.22
Negro	16	7.25	23	10.43	22.94	110.52	8.75	12.58	966.10	54.19	10.84
Total	148	5.44	276	10.15	17.77	97.18	5.31	9.89	968.06	853.24	11.20

TABLE III.—*Military posts in each department, alphabetically arranged, with mean strength, and admissions for disease and injury; also discharges and deaths, with ratios per thousand of strength for admissions and noneffectiveness, the averages of daily sickness, and the meteorological data for 1896.*

DEPARTMENT OF THE EAST.

Name of station.	Mean strength.	Cases.			Admission rate per 1,000 of mean strength.	Average number of sick daily.	Constantly noneffective per 1,000 of mean strength.	Discharges for disability.	Deaths.	Altitude of station.	Temperature.			Total precipitation.
		Disease.	Injury.	Total.							Mean.	Maximum.	Minimum.	
										Feet.	°	°	°	*In.*
Adams, Fort, R. I	285	175	94	269	943.86	9.01	31.60	1	...	30	48.3	92	—12	38.65
Allegheny Arsenal, Pa	32	17	4	21	656.25	.26	8.20	...	1	704	53.3	94	— 2	44.35
Augusta Arsenal, Ga	29	23	5	28	965.52	2.13	73.58	1	...	600	65.3	101	15	43.45
Baltimore attending surgeon, Md	10	...	...	...	...	...	...	...	...	...	55.8	98	5	40.77
Barrancas, Fort, Fla	134	150	52	202	1,507.46	7.14	53.30	1	...	30	67.9	99	22	62.14
Boston attending surgeon, Mass	26	1	...	1	38.46	.01	.42	...	...	...	49.2	95	—11	37.55
Columbia Arsenal, Tenn	19	20	2	22	1,157.89	.52	27.32	...	...	...	...	...	...	...
Columbus Barracks, Ohio	468	469	93	562	1,200.85	19.75	42.20	3	2	759	53.0	95	— 3	40.53
Columbus, Fort, N. Y	235	219	58	277	1,178.72	5.93	25.22	4	...	25	51.2	94	— 6	37.99
Ethan Allen, Fort, Vt	223	153	93	246	1,103.14	8.17	36.66	1	3	332	46.4	94	—20	28.38
Frankford Arsenal, Pa	45	27	6	33	733.33	.94	20.95	...	...	12	54.5	97	— 2	32.15
Hamilton, Fort, N. Y	268	231	63	294	1,097.01	7.94	29.63	2	...	47	52.4	94	— 3	42.15
Jackson Barracks, La	145	113	24	137	944.83	3.68	25.40	1	...	10	69.4	96	28	49.68
Kennebec Arsenal, Me	15	12	2	14	933.33	.28	18.94	...	...	200	...	...	...	...
Key West Barracks, Fla	132	117	33	150	1,136.36	2.78	21.03	...	...	12	76.4	90	52	25.72
Madison Barracks, N. Y	476	373	139	512	1,075.63	13.22	27.77	4	3	262	44.6	91	—40	33.01
McHenry, Fort, Md	186	164	51	215	1,155.91	6.59	35.43	...	1	36	55.8	98	5	40.77
McPherson, Fort, Ga	532	419	119	538	1,011.28	21.74	40.86	8	6	1,200	62.2	97	10	34.12
Monroe, Fort, Va	531	660	177	837	1,576.27	23.73	44.70	3	1	7	59.9	96	13	51.08
Myer, Fort, Va	284	462	177	639	2,250.00	12.26	43.15	3	2	200	55.5	98	8	31.16
New York attending surgeon, N. Y	20	4	...	4	200.00	.13	6.42	...	1	...	51.2	94	— 6	37.99
Niagara, Fort, N. Y	201	179	51	230	1,144.28	7.87	39.16	1	2	271	48.1	93	— 5	25.00
Philadelphia attending surgeon, Pa	11	2	...	2	181.82	.17	15.90	...	...	...	54.5	97	— 2	32.15
Plattsburg Barracks, N. Y.	517	358	136	494	955.51	11.89	22.99	1	3	186	42.8	95	—25	37.25
Porter, Fort, N. Y	115	42	14	56	486.96	2.50	21.72	...	1	600	47.1	86	— 9	37.29
Preble, Fort, Me	67	35	14	49	731.34	.94	14.07	...	...	51	44.6	92	—13	45.44
St. Francis Barracks, Fla	156	146	32	178	1,141.03	5.75	36.87	2	2	10	68.3	95	29	40.69
Sandy Hook proving ground, N. J	65	50	11	61	938.46	.63	9.71	1	...	...	...	...	...	...
Schuyler, Fort, N. Y	117	102	41	143	1,222.22	2.84	24.24	2	2	25	...	...	...	...
Slocum, Fort, N. Y	194	252	74	326	1,680.41	7.88	40.62	2	1	30	...	...	...	...
Springfield Armory, Mass	37	38	11	49	1,324.32	.85	23.04	...	...	250	46.8	96	—15	41.14
Thomas, Fort, Ky	483	534	152	686	1,420.29	24.46	50.64	12	3	920	55.6	96	— 2	34.48
Trumbull, Fort, Conn	68	21	17	38	558.82	1.25	18.32	...	...	25	49.1	93	— 3	30.05
Wadsworth, Fort, N. Y	201	138	40	178	885.57	5.80	28.83	2	3	160	51.2	94	— 6	37.99
Warren, Fort, Mass	131	118	35	153	1,167.94	3.98	30.35	1	1	38	49.2	95	—11	37.55
Washington Barracks, D.C.	351	725	65	790	2,250.71	15.62	44.51	5	1	106	55.5	98	8	31.16
Watertown Arsenal, Mass	40	33	2	35	875.00	1.14	28.42	...	...	100	...	...	...	...
Watervliet Arsenal, N. Y	60	68	13	81	1,350.00	2.42	40.30	1	...	50	48.4	95	—16	27.88
West Point, N. Y	381	433	93	526	1,380.58	11.49	30.14	4	...	107	49.1	97	—11	45.54
Willets Point, N. Y	409	367	60	427	1,044.01	10.39	25.39	...	...	70	50.7	95	— 4	44.96
Field	281	362	81	443	1,576.51	4.43	15.76	...	...	...	...	...	...	...
Total	7,980	7,812	2,134	9,946	1,246.37	268.49	33.65	66	39	...	...	...	...	...

TABLE III.—*Military posts in each department, alphabetically arranged, with mean strength, and admissions for disease and injury, etc.*—Continued.

DEPARTMENT OF THE MISSOURI.

Name of station.	Mean strength.	Cases.			Admission rate per 1,000 of mean strength.	Average number of sick daily.	Constantly noneffective per 1,000 of mean strength.	Discharges for disability.	Deaths.	Altitude of station.	Temperature.			Total precipitation.
		Disease.	Injury.	Total.							Mean.	Maximum.	Minimum.	
										Feet.	°	°	°	*In.*
Brady, Fort, Mich	256	172	32	204	796.87	9.75	38.08	3	3	606	39.5	89	—25	34.62
Chicago headquarters, Ill	25	5	.....	5	200.00	.51	20.44	...	...	661	49.8	98	— 9	33.14
Indianapolis Arsenal, Ind	25	40	1	41	1,640.00	.74	29.51	...	...	608	54.1	98	— 5	39.84
Jefferson Barracks, Mo	345	435	108	543	1,573.91	23.19	67.23	6	6	475	57.9	100	5	37.55
Leavenworth, Fort, Kans	758	638	224	862	1,137.20	29.90	39.46	9	5	844	.....	.....	.....	.....
Little Rock, Ark	64	44	18	62	968.75	2.40	37.57	1	1	302	63.4	105	15	33.32
Reno, Fort, Okla	352	214	95	309	877.84	10.18	28.93	5	...	1,400	61.1	107	9	19.13
Riley, Fort, Kans	826	818	497	1,315	1,592.01	36.45	44.13	11	3	1,300	56.1	103	0	38.28
Rock Island Arsenal, Ill	66	70	12	82	1,242.42	1.62	24.55	...	1	528	50.8	96	— 8	28.68
Sheridan, Fort, Ill	738	550	242	792	1,073.17	25.49	34.55	7	3	746	48.2	95	—11	27.26
Sill, Fort, Okla	406	355	83	438	1,078.82	12.48	30.74	3	5	1,200	63.0	109	10	17.12
Wayne, Fort, Mich	250	108	34	142	568.00	5.21	20.85	2	...	580	48.6	95	— 6	36.20
Field	187	126	59	185	989.30	2.05	10.99	...	...	.....	.....	.....	.....	.....
Total	4,298	3,575	1,405	4,980	1,158.68	159.98	37.23	47	27	.....	.....	.....	.....	.....

DEPARTMENT OF DAKOTA.

Assiniboine, Fort, Mont	431	158	75	233	540.60	7.81	18.12	...	1	2,690	39.7	98	—33	16.48
Custer, Fort, Mont	442	205	75	280	818.71	11.29	33.00	6	2	3,238	45.3	104	—30	25.08
Harrison, Fort, Mont	124	56	25	81	653.22	3.63	29.24	2	...	4,000	43.7	95	—22	15.38
Keogh, Fort, Mont	286	213	68	281	982.52	9.56	33.43	5	2	2,365	43.4	100	—27	11.28
Missoula, Fort, Mont	272	122	49	171	628.68	7.18	26.41	5	3	3,330	42.7	97	— 6	13.52
Saint Paul headquarters, Minn	30	.....	.....	.....	.....	.....	.....	...	...	840	44.0	100	—18	34.73
Snelling, Fort, Minn	483	376	111	487	1,008.28	20.79	43.05	11	1	840	45.0	99	—18	30.65
Yates, Fort, N. Dak	214	183	77	260	1,214.95	9.52	44.50	1	3	1,670	40.6	105	—24	20.08
Yellowstone, Fort, Wyo	108	32	11	43	398.15	1.04	9.59	...	...	6,270	39.0	88	—27	20.77
Field	152	45	29	74	486.84	1.23	8.09	...	...	.....	.....	.....	.....	.....
Total	2,442	1,390	520	1,910	782.15	72.05	29.50	30	12	.....	.....	.....	.....	.....

DEPARTMENT OF THE PLATTE.

Crook, Fort, Nebr	497	470	129	599	1,205.23	23.06	46.41	9	2	960	.....	.....	.....	.....
D. A. Russell, Fort, Wyo	463	550	220	770	1,663.07	17.54	37.89	5	...	6,205	.....	.....	.....	.....
Meade, Fort, S. Dak	456	294	162	456	1,000.00	12.95	28.40	2	1	3,624	48.3	102	—20	17.61
Niobrara, Fort, Nebr	502	450	150	600	1,195.22	17.16	34.17	1	4	2,600	.....	.....	.....	.....
Omaha, headquarters, Nebr	10	3	.....	3	300.00	.15	15.30	...	...	960	51.2	96	— 8	35.90
Robinson, Fort, Nebr	379	274	106	380	1,002.64	10.54	27.82	6	7	3,764	48.6	101	—17	12.60
Washakie, Fort, Wyo	126	125	51	176	1,396.82	4.25	33.76	...	1	5,462	42.9	96	—30	11.07
Field	96	39	19	58	604.17	.61	6.35	...	...	.....	.....	.....	.....	.....
Total	2,529	2,205	837	3,042	1,202.85	86.27	34.11	23	15	.....	.....	.....	.....	.....

TABLE III.—*Military posts in each department, alphabetically arranged, with mean strength, and admissions for disease and injury, etc.*—Continued.

DEPARTMENT OF TEXAS.

Name of station.	Mean strength.	Cases.			Admission rate per 1,000 of mean strength.	Average number of sick daily.	Constantly noneffective per 1,000 of mean strength.	Discharges for disability.	Deaths.	Altitude of station.	Temperature.			Total precipitation.
		Disease.	Injury.	Total.							Mean.	Maximum.	Minimum.	
										Ft.	°	°	°	In.
Bliss, Fort, Tex	200	142	47	189	945.00	4.26	21.31	1	1	3,700	64.3	103	14	9.79
Brown, Fort, Tex	111	98	33	131	1,180.18	5.24	47.23	...	...	47	73.9	101	30	.....
Clark, Fort, Tex	371	556	175	731	1,970.35	18.07	48.70	10	...	1,133	67.4	109	24	18.55
Eagle Pass, Camp, Tex	68	104	27	131	1,926.47	4.47	65.74	1	...	800	72.2	110	18	.....
McIntosh, Fort, Tex	119	131	40	171	1,436.97	7.58	63.67	1	1	806	71.8	104	27	21.24
Ringgold, Fort, Tex	126	124	34	158	1,253.97	4.93	39.14	...	3	147	73.8	107	22	17.10
Sam Houston, Fort, Tex	646	374	143	517	800.31	17.89	27.70	6	10	779	70.7	102	25	34.81
San Antonio headquarters, Tex	15	1	.....	1	66.67	.02	12.75	...	1	781	....	....	....	.....
Field	69	34	13	47	681.16	.35	5.03	...	...	.....	....	....	....	.....
Total	1,725	1,564	512	2,076	1,203.48	62.81	36.41	19	16	.....	....	....	....	.....

DEPARTMENT OF THE COLORADO.

Apache, Fort, Ariz	325	141	114	255	784.62	8.64	26.59	4	...	5,200	54.2	101	6	16.09
Bayard, Fort, N. Mex	354	256	68	324	915.25	7.52	21.25	2	...	6,750	55.8	99	12	.....
Denver headquarters, Colo	16	1	2	3	187.50	.59	36.71	...	...	5,290	51.6	96	—9	11.84
Douglas, Fort, Utah	508	374	125	499	982.28	15.28	30.09	4	3	4,920	51.5	97	—2	18.42
DuChesne, Fort, Utah	120	72	37	109	908.33	3.72	31.03	1	1	5,000	45.1	100	—17	6.99
Grant, Fort, Ariz	294	243	103	346	1,176.87	10.74	36.52	8	2	4,916	62.4	106	21	15.09
Huachuca, Fort, Ariz	253	298	81	379	1,498.02	9.81	38.79	3	4	5,100	61.1	103	20	14.27
Logan, Fort, Colo	580	626	170	796	1,372.41	22.70	39.15	2	4	5,450	51.6	96	—9	11.84
San Carlos, Ariz	46	35	22	57	1,239.13	1.01	22.04	...	...	2,456	64.8	117	15	13.88
Whipple Barracks, Ariz	210	139	59	198	942.86	7.01	33.40	8	1	5,318	53.7	104	2	16.23
Wingate, Fort, N. Mex	212	241	92	333	1,570.75	9.84	46.44	4	1	7,000	51.7	99	—2	10.63
Field	154	93	41	134	870.13	1.75	11.37	...	3	.....	....	....	....	.....
Total	3,072	2,519	914	3,433	1,117.51	98.64	32.11	36	19	.....	....	....	....	.....

DEPARTMENT OF CALIFORNIA.

Alcatraz Island, Cal	134	50	14	64	477.61	3.23	24.10	...	...	135	55.9	91	33	28.25
Angel Island, Cal	256	102	32	134	523.44	5.52	21.56	...	...	150	....	....	....	.....
Benicia Barracks, Cal	209	75	38	113	540.67	2.92	13.96	2	2	160	56.4	88	33	35.21
Mason, Fort, Cal	73	38	12	50	684.93	1.64	22.46	...	1	80	55.9	91	33	28.25
Presidio of San Francisco, Cal	559	399	157	556	994.63	16.86	30.15	6	2	72	....	....	....	.....
San Diego Barracks, Cal	64	58	11	69	1,078.12	3.22	50.33	3	...	6	61.9	98	39	8.73
San Francisco headquarters, Cal	28	3	...	3	107.14	.14	5.07	...	...	.....	55.9	91	33	28.25
Field	216	112	72	184	851.86	3.45	15.95	...	1	.....	....	....	....	.....
Total	1,539	837	336	1,173	762.18	36.97	24.02	11	6	.....	....	....	....	.....

DEPARTMENT OF THE COLUMBIA.

Boise Barracks, Idaho	116	77	24	101	870.69	3.27	28.17	...	...	2,765	60.6	106	—10	22.95
Canby, Fort, Wash	94	46	23	69	734.04	2.50	26.60	...	...	8	50.2	89	20	78.57
Sherman, Fort, Idaho	279	204	71	275	985.66	8.28	29.66	4	1	2,140	46.6	101	—15	31.27
Spokane, Fort, Wash	167	94	38	132	790.42	5.49	32.87	2	...	1,400	47.2	107	—25	17.02
Vancouver Barracks, Wash	568	344	121	465	818.66	12.79	22.52	5	2	50	52.6	93	11	44.13
Walla Walla, Fort, Wash	254	177	87	264	1,039.37	10.52	41.42	...	...	865	53.5	106	—9	19.41
Field	13	3	4	7	538.46	.07	5.04	...	...	.....	....	....	....	.....
Total	1,491	945	368	1,313	880.62	42.91	28.78	11	3	.....	....	....	....	.....

TABLE III.—*Military posts in each department, alphabetically arranged, with mean strength, and admissions for disease and injury, etc.*—Continued.

SUNDRY.

Name of station.	Mean strength.	Cases.			Admission rate per 1,000 of mean strength.	Average number of sick daily.	Constantly noneffective per 1,000 of mean strength.	Discharges for disability.	Deaths.	Altitude of station.	Temperature.			Total precipitation.
		Disease.	Injury.	Total.							Mean.	Maximum.	Minimum.	
General hospital, Hot Springs, Ark	43	18	1	19	441.86	25.12	.....	15	1	.....	64.4	13	108	37.11
At large	.....	.....	.....	.....	.....	.....	.....	18	10	.....	.....	.....	.....	.....
Total for the Army	25,119	20,865	7,027	27,892	1,110.39	853.24	33.97	276	148	.....	.....	.....	.....	.....

TABLE IV.—*General view of the results of disease and injury at each of the military stations, arranged in the order of their mean strength.*

GROUP 1.—TWENTY-TWO STATIONS, GARRISONED BY 400 MEN OR MORE EACH.

Name of station.	Mean strength.	Admission rate per 1,000 of mean strength.	Constantly noneffective.			Discharges.		Deaths.	
			Daily average in hospital.	Ratio per 1,000 of mean strength.		Number.	Ratio per 1,000 of mean strength.	Number.	Ratio per 1,000 of mean strength.
				Cases in hospital.	All cases.				
Fort Riley, Kans	826	1,592.01	17.72	21.45	44.13	11	13.32	3	3.63
Fort Leavenworth, Kans	758	1,137.20	22.20	29.29	39.46	9	11.87	5	6.60
Fort Sheridan, Ill	738	1,073.17	20.18	27.35	34.55	7	9.49	3	4.06
Fort Sam Houston, Tex	646	800.31	16.95	26.24	27.70	6	9.29	10	15.48
Fort Logan, Colo	580	1,372.41	20.47	35.29	39.15	2	3.45	4	6.90
Vancouver Barracks, Wash	568	818.66	8.86	15.60	22.52	5	8.80	2	3.52
Presidio of San Francisco, Cal	559	994.63	14.37	25.72	30.15	6	10.73	2	3.58
Fort McPherson, Ga	532	1,011.28	13.84	26.02	40.86	8	15.04	6	11.28
Fort Monroe, Va	531	1,576.27	9.76	18.37	44.70	3	5.65	1	1.88
Plattsburg Barracks, N. Y	517	955.51	8.34	16.14	22.99	1	1.93	3	5.80
Fort Douglas, Utah	508	982.28	11.90	23.43	30.09	4	7.87	3	5.91
Fort Niobrara, Nebr	502	1,195.22	14.55	28.99	34.17	1	1.99	4	7.97
Fort Crook, Nebr	497	1,205.23	16.23	32.66	46.41	9	18.11	2	4.02
Fort Snelling, Minn	483	1,008.28	13.25	27.42	43.05	11	22.77	1	2.07
Fort Thomas, Ky	483	1,420.29	18.09	38.69	50.64	12	24.84	3	6.21
Madison Barracks, N. Y	476	1,075.63	6.43	13.52	27.77	4	8.40	3	6.30
Columbus Barracks, Ohio	468	1,200.85	16.57	35.40	42.20	3	6.41	2	4.27
Fort D. A. Russell, Wyo	463	1,663.07	13.23	28.57	37.89	5	10.80	.....	.....
Fort Meade, S. Dak	456	1,000.00	9.32	20.45	28.40	2	4.39	1	2.19
Fort Assiniboine, Mont	431	540.60	5.90	13.68	18.12	.....	.....	1	2.32
Willets Point, N. Y	409	1,044.01	9.42	23.03	25.39	.....	.....	.....	.....
Fort Sill, Okla	406	1,078.82	6.23	15.34	30.74	3	7.39	5	12.32
Mean	538	.....	13.38	.....	.....	.....	.....	.....	.....
Summary	11,837	1,135.51	294.42	24.87	35.01	112	9.46	64	5.41

TABLE IV.—*General view of the results of disease and injury at each of the military stations, arranged in the order of their mean strength*—Continued.

GROUP 2.—NINE STATIONS, GARRISONED BY 300 TO 400 MEN EACH.

Name of station.	Mean strength.	Admission rate per 1,000 of mean strength.	Constantly non-effective.			Discharges.		Deaths.	
			Daily average in hospital.	Ratio per 1,000 of mean strength.		Number.	Ratio per 1,000 of mean strength.	Number.	Ratio per 1,000 of mean strength.
				Cases in hospital.	All cases.				
West Point, N. Y.	381	1,380.58	8.45	22.16	30.14	4	10.50	....	.....
Fort Robinson, Nebr.	379	1,002.64	7.34	19.37	27.82	6	15.83	7	18.47
Fort Clark, Tex.	371	1,970.35	9.34	25.19	48.70	10	26.95	....	.....
Fort Bayard, N. Mex.	354	915.25	6.34	17.91	21.25	2	5.65	....	.....
Fort Reno, Okla.	352	877.84	8.09	22.98	28.93	5	14.20	....	.....
Washington Barracks, D. C.	351	2,250.71	15.21	43.34	44.51	5	14.25	1	2.85
Jefferson Barracks, Mo.	345	1,573.91	18.61	53.96	67.23	6	17.39	6	17.39
Fort Custer, Mont.	342	818.71	7.89	23.07	33.00	6	17.54	2	5.85
Fort Apache, Ariz.	325	784.62	5.67	17.44	26.59	4	12.31	....	.....
Mean	356	.....	9.66	.....	.....	....	.....	....	.....
Summary	3,200	1,293.13	86.94	27.17	36.42	48	15.00	16	5.00

GROUP 3.—TWENTY-ONE STATIONS, GARRISONED BY 200 TO 300 MEN EACH.

Fort Grant, Ariz.	294	1,176.87	7.18	24.42	36.52	8	27.21	2	6.80
Fort Keogh, Mont.	286	982.52	5.13	17.92	33.43	5	17.48	2	6.99
Fort Adams, R. I.	285	943.86	5.87	20.58	31.60	1	3.51	....	.....
Fort Myer, Va.	284	2,250.00	8.94	31.47	43.15	3	10.56	2	7.04
Fort Sherman, Idaho.	279	985.66	6.58	23.59	29.66	4	14.34	1	3.58
Fort Missoula, Mont.	272	628.68	6.14	22.57	26.41	5	18.38	3	11.03
Fort Hamilton, N. Y.	268	1,097.01	7.40	27.62	29.63	2	7.46	....	.....
Fort Brady, Mich.	256	796.87	8.76	34.22	38.08	3	11.72	3	11.72
Angel Island, Cal.	256	523.44	5.00	19.54	21.56	....	.....	....	.....
Fort Walla Walla, Wash.	254	1,039.37	6.20	24.40	41.42	....	.....	....	.....
Fort Huachuca, Ariz.	253	1,498.02	7.23	28.58	38.79	3	11.86	4	15.81
Fort Wayne, Mich.	250	568.00	4.08	16.33	20.85	2	8.00	....	.....
Fort Columbus, N. Y.	235	1,178.72	4.29	18.25	25.22	4	17.02	....	.....
Fort Ethan Allen, Vt.	223	1,103.14	6.42	28.77	36.66	1	4.48	3	13.45
Fort Yates, N. Dak.	214	1,214.95	5.38	25.15	44.50	1	4.67	3	14.02
Fort Wingate, N. Mex.	212	1,570.75	5.95	28.08	46.44	4	18.87	1	4.72
Whipple Barracks, Ariz.	210	942.86	5.61	26.70	33.40	8	38.10	1	4.76
Benicia Barracks, Cal.	209	540.67	1.56	7.45	13.96	2	9.57	2	9.57
Fort Niagara, N. Y.	201	1,144.28	6.54	32.54	39.16	1	4.98	2	9.95
Fort Wadsworth, N. Y.	201	885.57	4.00	19.90	28.83	2	9.95	3	14.93
Fort Bliss, Tex.	200	945.00	3.68	18.37	21.31	1	5.00	1	5.00
Mean	245	.....	5.81	.....	.....	....	.....	....	.....
Summary	5,142	1,054.45	121.92	23.72	32.51	60	11.67	33	6.42

TABLE IV.—*General view of the results of disease and injury at each of the military stations, arranged in the order of their mean strength*—Continued.

GROUP 4.—NINETEEN STATIONS, GARRISONED BY 100 TO 200 MEN EACH.

Name of station.	Mean strength.	Admission rate per 1,000 of mean strength.	Constantly non-effective.			Discharges.		Deaths.	
			Daily average in hospital.	Ratio per 1,000 of mean strength.		Number.	Ratio per 1,000 of mean strength.	Number.	Ratio per 1,000 of mean strength.
				Cases in hospital.	All cases.				
Fort Slocum, N. Y	194	1,680.41	5.55	28.60	40.62	2	10.31	1	5.15
Fort McHenry, Md.	186	1,155.91	4.90	26.34	35.43	....	....	1	5.38
Fort Spokane, Wash	167	790.42	4.55	27.24	32.87	2	11.98	....	....
St. Francis Barracks, Fla	156	1,141.03	4.15	26.62	36.87	2	12.82	2	12.82
Jackson Barracks, La	145	944.83	2.75	18.99	25.40	1	6.90	....	....
Fort Barrancas, Fla	134	1,507.46	5.91	44.12	53.30	1	7.46	....	....
Alcatraz Island, Cal	134	477.61	2.65	19.80	24.10	....	....	....	....
Key West Barracks, Fla	132	1,136.36	1.57	11.92	21.03	....	....	....	....
Fort Warren, Mass	131	1,167.94	2.88	21.98	30.35	1	7.63	1	7.63
Fort Ringgold, Tex	126	1,253.97	3.96	31.46	39.14	....	....	3	23.81
Fort Washakie, Wyo	126	1,396.82	1.58	12.56	33.76	....	....	1	7.94
Fort Harrison, Mont	124	653.22	1.76	14.19	29.24	2	16.13	....	....
Fort DuChesne, Utah	120	908.33	1.83	15.26	31.03	1	8.33	1	8.33
Fort McIntosh, Tex	119	1,436.97	5.58	46.91	63.67	1	8.40	1	8.40
Fort Schuyler, N. Y	117	1,222.22	2.27	19.38	24.24	2	17.09	2	17.09
Boise Barracks, Idaho	116	870.69	2.72	23.46	28.17	....	....	....	....
Fort Porter, N. Y	115	486.96	1.99	17.27	21.72	....	....	1	8.70
Fort Brown, Tex	111	1,180.18	4.84	43.57	47.23	....	....	....	....
Fort Yellowstone, Wyo	108	398.15	.88	8.12	9.59	....	....	....	....
Mean	135	....	3.28	....	....	....	....	....	....
Summary	2,561	1,064.43	62.33	24.34	33.39	15	5.86	14	5.47

GROUP 5.—TWENTY-NINE STATIONS, GARRISONED BY LESS THAN 100 MEN EACH.

Fort Canby, Wash	94	734.04	1.39	14.74	26.60	....	....	....	....
Fort Mason, Cal	73	684.93	1.33	18.23	22.46	....	....	1	13.70
Camp Eagle Pass, Tex	68	1,926.47	2.99	43.96	65.74	1	14.71	....	....
Fort Trumbull, Conn	68	558.82	1.00	14.75	18.32	....	....	....	....
Fort Preble, Me	67	731.34	.54	7.99	14.07	....	....	....	....
Rock Island Arsenal, Ill	66	1,242.42	.39	5.96	24.55	....	....	1	15.15
Sandy Hook Proving Ground, N. J	65	938.46	....	....	9.71	1	15.38	....	....
Little Rock, Ark	64	968.75	2.31	36.07	37.57	1	15.62	1	15.62
San Diego Barracks, Cal	64	1,078.12	1.87	29.24	50.33	3	46.87	....	....
Watervliet Arsenal, N. Y	60	1,350.00	1.17	19.44	40.30	1	16.67	....	....
San Carlos, Ariz	46	1,239.13	.22	4.75	22.04	....	....	....	....
Frankford Arsenal, Pa	45	733.33	....	....	20.95	....	....	....	....
Watertown Arsenal, Mass	40	875.00	.37	9.15	28.42	....	....	....	....
Springfield Armory, Mass	37	1,324.32	.03	.74	23.04	....	....	....	....
Allegheny Arsenal, Pa	32	656.25	.01	.34	8.20	....	....	1	31.25
St. Paul headquarters, Minn	30	....	....	....	....	....	....	....	....
Augusta Arsenal, Ga	29	965.52	.26	8.95	73.58	1	34.49	....	....
San Francisco headquarters, Cal	28	107.14	....	....	5.07	....	....	....	....
Boston attending surgeon, Mass	26	38.46	....	....	.42	....	....	....	....
Chicago headquarters, Ill	25	200.00	....	....	20.44	....	....	....	....
Indianapolis Arsenal, Ind	25	1,640.00	....	....	29.51	....	....	....	....
New York attending surgeon, N. Y	20	200.00	....	....	6.42	....	....	1	50.00
Columbia Arsenal, Tenn	19	1,157.89	....	....	27.32	....	....	....	....
Denver headquarters, Colo	16	187.50	....	....	36.71	....	....	....	....
Kennebec Arsenal, Me	15	933.33	....	....	18.94	....	....	....	....
San Antonio headquarters, Tex	15	66.67	....	....	12.75	....	....	1	66.67
Philadelphia attending surgeon, Pa	11	181.82	....	....	15.90	....	....	....	....
Baltimore attending surgeon, Md	10	....	....	....	....	....	....	....	....
Omaha headquarters, Nebr	10	300.00	....	....	15.30	....	....	....	....
Mean	40	....	.48	....	....	....	....	....	....
Summary	1,168	868.16	13.87	11.87	20.29	8	6.85	6	5.14

TABLE IV.—*General view of the results of disease and injury at each of the military stations, arranged in the order of their mean strength*—Continued.

GROUP 6.—FIELD AND SUNDRY.

Name of station.	Mean strength.	Admission rate per 1,000 of mean strength.	Constantly non-effective.			Discharges.		Deaths.	
			Daily average in hospital.	Ratio per 1,000 of mean strength.		Number.	Ratio per 1,000 of mean strength.	Number.	Ratio per 1,000 of mean strength.
				Cases in hospital.	All cases.				
Field, East	281	1,576.51	.....	.....	15.76	....	.....	....	.....
Field, California	216	851.86	.....	.....	15.95	....	.....	1	4.63
Field, Missouri	187	989.30	.....	.....	10.99	....	.....	....	.....
Field, Colorado	154	870.13	.....	.....	11.37	....	.....	3	19.48
Field, Dakota	152	486.84	.....	.....	8.09	....	.....	....	.....
Field, Platte	96	604.17	.....	.....	6.35	....	.....	....	.....
Field, Texas	69	681.16	.....	.....	5.03	....	.....	....	.....
Field, Columbia	13	538.46	.....	.....	5.04	....	.....	....	.....
Summary	1,168	969.18	.9.....	.....	11.93	....	.....	4	3.42
General hospital, Hot Springs, Ark	43	441.86	25.04	.....	.....	15	.....	1	.....
At large	.....	.....	.....	.....	.....	18	.....	10	.....
Total for the Army	25,119	1,110.39	604.52	24.07	33.97	276	10.15	148	5.44

TABLE V.—*Twenty posts having the highest admission rates for the year 1896; also their admission rates for the years 1891 to 1895, inclusive.*

Name of station.	Mean strength.	Ratio per 1,000 of mean strength.				Admission rate per 1,000 of mean strength.				
		Admissions.	Discharges.	Deaths.	Constantly non-effective.	1895.	1894.	1893.	1892.	1891.
Washington Barracks, D.C.	351	2,250.71	14.25	2.85	44.51	2,137.74	1,794.30	2,027.87	1,981.93	1,774.19
Fort Myer, Va	284	2,250.00	10.56	7.04	43.15	2,800.00	2,167.33	2,034.75	1,618.64	1,063.58
Fort Clark, Tex	371	1,970.35	26.95	.....	48.70	1,560.54	1,619.04	2,165.60	1,538.94	1,256.72
Camp Eagle Pass, Tex	68	1,926.47	14.71	.....	65.74	1,424.24	2,213.11	2,196.43	2,113.21	1,788.46
Fort Slocum, N. Y	194	1,680.41	10.31	5.15	40.62	2,103.45	1,326.08	2,283.76	2,115.32	1,884.82
Fort D. A. Russell, Wyo	463	1,663.07	10.80	.....	37.89	1,354.52	958.64	1,091.10	766.90	870.02
Fort Riley, Kans	826	1,592.01	13.32	3.63	44.13	1,391.87	1,222.39	1,358.00	1,158.89	1,408.33
Fort Monroe, Va	531	1,576.27	5.65	1.88	44.70	1,473.87	1,060.55	1,379.01	1,797.33	1,379.86
Jefferson Barracks, Mo	345	1,573.91	17.39	17.39	67.23	1,216.10	1,330.27	2,004.13	875.49	1,068.49
Fort Wingate, N. Mex	212	1,570.75	18.87	4.72	46.44	1,370.23	1,669.49	1,564.10	1,396.65	1,776.47
Fort Barrancas, Fla	134	1,507.46	7.46	.....	53.30	1,105.88	1,152.67	1,883.33	1,986.67	2,629.63
Fort Huachuca, Ariz	253	1,498.02	11.86	15.81	38.79	1,020.00	747.51	1,308.22	899.37	601.94
Fort McIntosh, Tex	119	1,436.97	8.40	8.40	63.67	1,463.28	1,235.29	1,218.18	1,442.95	1,261.44
Fort Thomas, Ky	483	1,420.29	24.84	6.21	50.64	1,490.41	1,137.50	907.61	1,123.13	1,401.52
Fort Washakie, Wyo	126	1,396.82	.....	7.94	33.76	1,170.45	1,016.00	1,175.00	677.42	861.84
West Point, N. Y	381	1,380.58	10.50	.....	30.14	1,393.78	1,242.18	1,396.87	1,424.00	981.23
Fort Logan, Colo	580	1,372.41	3.45	6.90	39.15	1,181.36	1,108.43	1,128.13	1,012.05	1,588.85
Watervliet Arsenal, N. Y	60	1,350.00	16.67	.....	40.30	1,065.57	1,213.11	1,063.49	1,472.73	1,186.44
Fort Ringgold, Tex	126	1,253.97	.....	23.81	39.14	2,078.21	1,289.16	1,939.60	1,716.42	1,366.07
Rock Island Arsenal, Ill	66	1,242.42	.....	15.15	24.55	772.73	812.50	1,184.62	1,292.31	1,093.75
The Army	25,119	1,110.39	10.15	5.44	33.97	1,110.22	1,089.73	1,289.04	1,270.42	1,364.78

TABLE VI. *Twenty posts having the lowest admission rates for the year 1896; also their admission rates for the years 1891 to 1895, inclusive.*

Name of station.	Mean strength.	Ratio per 1,000 of mean strength.				Admission rate per 1,000 of mean strength.				
		Admission.	Discharges.	Deaths.	Constantly non-effective.	1895.	1894.	1893.	1892.	1891.
Fort Yellowstone, Wyo	108	398.15	.....	.....	9.59	422.02	529.41	520.00	1,105.26	1,033.90
Alcatraz Island, Cal	134	477.61	.....	.....	24.10	461.54	692.98	694.91	1,025.64	1,067.16
Fort Porter, N. Y	115	486.96	.....	8.70	21.72	515.62	853.33	1,814.16	1,133.33	1,047.17
Angel Island, Cal	256	523.44	.....	.....	21.56	670.50	590.10	826.09	980.14	1,210.34
Fort Assininiboine, Mont	431	540.60	.....	2.32	18.12	903.03	826.97	1,182.88	1,128.54	1,113.62
Benicia Barracks, Cal	209	540.67	9.57	9.57	13.96	862.39	918.66	792.45	825.76	933.33
Fort Trumbull, Conn	68	558.82	.....	.....	18.32	800.00	446.15	593.75	1,942.39	769.23
Fort Wayne, Mich	250	568.00	8.00	.....	20.85	484.62	609.44	1,162.60	1,226.18	1,198.67
Fort Missoula, Mont	272	628.68	18.38	11.03	26.41	578.75	552.63	773.87	993.17	983.67
Fort Harrison, Mont	124	653.22	16.13	.....	29.24	1,071.43	.....	.....	.....	.....
Fort Mason, Cal	73	684.93	.....	13.70	22.46	676.47	373.13	741.94	689.66	538.71
Fort Preble, Me	67	731.34	.....	.....	14.07	1,014.49	1,223.85	919.35	1,238.07	909.09
Fort Canby, Wash	94	734.04	.....	.....	26.60	936.00	548.67	698.11	1,292.45	1,739.00
Fort Apache, Ariz	325	784.62	12.31	.....	26.59	1,073.94	1,021.05	1,178.26	1,345.18	2,362.38
Fort Spokane, Wash	167	790.42	11.98	.....	32.87	883.98	808.82	659.57	518.53	696.77
Fort Brady, Mich	256	796.87	11.72	11.72	38.08	775.42	928.99	970.59	923.08	801.72
Fort Sam Houston, Tex	646	800.31	9.29	15.48	27.70	1,086.89	1,471.66	1,359.28	1,683.84	1,985.97
Vancouver Barracks, Wash	568	818.66	8.80	3.52	22.52	655.59	471.40	518.18	727.27	841.49
Fort Custer, Mont	342	818.71	17.54	5.85	33.00	674.19	279.88	333.33	1,534.18	1,985.56
Boise Barracks, Idaho	116	870.69	.....	.....	28.17	721.74	726.50	796.17	993.88	927.93
The Army	25,119	1,110.29	10.15	5.44	33.97	1,110.22	1,089.73	1,289.04	1,270.42	1,364.78

TABLE VII. *Twenty posts having the highest noneffective rates for the year 1896; also their noneffective rates for the years 1891 to 1895, inclusive.*

Name of station.	Mean strength.	Constantly non-effective per 1,000 of mean strength.	Average sick daily.	Average days that each case was treated.	Constantly noneffective per 1,000 of mean strength.				
					1895.	1894.	1893.	1892.	1891.
Jefferson Barracks, Mo	345	67.23	23.19	15.63	36.29	23.42	50.59	32.34	34.62
Camp Eagle Pass, Tex	68	65.74	4.47	12.49	22.17	60.95	68.74	76.30	49.21
Fort McIntosh, Tex	119	63.67	7.58	16.22	64.05	50.04	65.62	68.91	54.97
Fort Barrancas, Fla	134	53.30	7.14	12.94	37.87	42.58	44.41	70.64	103.33
Fort Thomas, Ky	483	50.64	24.46	13.05	52.19	36.34	26.10	42.19	32.77
San Diego Barracks, Cal	64	50.33	3.22	17.09	56.82	59.81	49.73	78.88	90.15
Fort Clark, Tex	371	48.70	18.07	9.05	40.40	52.39	79.79	60.77	39.61
Fort Brown, Tex	111	47.23	5.24	14.65	70.69	59.54	60.90	36.91	38.18
Fort Wingate, N. Mex	212	46.44	9.84	10.82	41.35	52.35	48.68	36.12	42.68
Fort Crook, Nebr	497	46.41	23.06	14.09	*51.26	*45.55	*28.01	*33.49	*40.74
Fort Monroe, Va	531	44.70	23.73	10.38	30.63	34.67	46.42	45.38	32.28
Washington Barracks, D. C	351	44.51	15.62	7.24	46.18	42.33	54.27	43.22	47.61
Fort Yates, N. Dak	214	44.50	9.52	13.41	28.20	43.49	44.02	64.98	53.03
Fort Riley, Kans	826	44.13	36.45	10.14	44.22	38.02	38.93	27.95	58.18
Fort Myer, Va	284	43.15	12.26	7.02	63.78	53.18	62.57	40.55	35.98
Fort Snelling, Minn	483	43.05	20.79	15.63	45.02	38.47	39.41	43.56	38.79
Columbus Barracks, Ohio	468	42.20	19.75	12.86	60.65	66.66	92.16	71.98	77.12
Fort Walla Walla, Wash	254	41.42	10.52	14.59	37.70	47.95	57.29	37.54	52.32
Fort McPherson, Ga	532	40.86	21.74	14.79	25.17	21.87	54.17	58.04	61.12
Fort Slocum, N. Y	194	40.62	7.88	8.85	45.60	36.76	48.44	46.31	51.62
The Army	25,119	33.97	853.24	11.20	33.89	34.49	40.15	39.60	42.01

* Fort Omaha, Nebr.

TABLE VIII.—*Twenty posts having the lowest noneffective rates for the year 1896; also their noneffective rates for the years 1891 to 1895, inclusive.*

Name of station.	Mean strength.	Constantly noneffective per 1,000 of mean strength.	Average sick daily.	Average days that each case was treated.	Constantly noneffective per 1,000 of mean strength.				
					1895.	1894.	1893.	1892.	1891.
Fort Yellowstone, Wyo	108	9.59	1.04	8.81	12.19	9.86	20.77	23.62	35.20
Sandy Hook Proving Ground, N. J.	65	9.71	.63	3.79	22.44	30.22	25.98	19.13	16.07
Benicia Barracks, Cal	209	13.96	2.92	9.45	17.83	24.49	23.43	21.24	24.14
Fort Preble, Me	67	14.07	.94	7.04	21.88	43.63	28.10	49.94	16.52
Fort Assiniboine, Mont	431	18.12	7.81	12.27	23.41	26.15	31.29	40.64	30.29
Fort Trumbull, Conn	68	18.32	1.25	12.00	12.84	11.00	19.52	36.93	22.15
Fort Wayne, Mich	250	20.85	5.21	13.44	17.62	21.94	37.99	50.78	44.52
Key West Barracks, Fla	132	21.03	2.78	6.77	28.70	61.68	42.62	.....	.....
Fort Bayard, N. Mex	354	21.25	7.52	8.50	28.92	21.25	30.89	59.22	50.56
Fort Bliss, Tex	200	21.31	4.26	8.25	34.20	52.71	46.80	25.25	29.44
Angel Island, Cal	256	21.56	5.52	15.07	24.18	24.40	40.04	36.63	50.04
Fort Porter, N. Y	115	21.72	2.50	16.32	10.27	17.76	40.22	35.91	29.18
Fort Mason, Cal	73	22.46	1.64	12.00	14.38	14.93	46.49	21.72	30.27
Vancouver Barracks, Wash	568	22.52	12.79	10.07	22.67	18.28	15.06	28.10	33.51
Plattsburg Barracks, N. Y	517	22.99	11.89	8.81	18.12	20.45	28.20	25.62	37.63
Alcatraz Island, Cal	134	24.10	3.23	18.47	26.11	26.94	18.37	40.35	48.15
Fort Schuyler, N. Y	117	24.24	2.84	7.26	19.03	29.50	31.03	33.68	29.81
Rock Island Arsenal, Ill	66	24.55	1.62	7.23	14.20	20.59	28.20	21.48	15.50
Fort Columbus, N. Y	235	25.22	5.93	7.83	24.34	36.78	38.89	38.31	30.45
Willets Point, N. Y	409	25.39	10.39	8.90	28.18	28.43	34.24	31.33	28.64
The Army	25,119	33.97	853.24	11.20	33.89	34.49	40.15	39.60	42.01

TABLE IX.—*Twenty posts having the highest admission rates for disease, exoluding venereal diseases, vaccinia, and alcoholism; also their ratios for deaths, discharges, and constant noneffectiveness, and the corresponding average rates for the Army, year 1896.*

Name of station.	Mean strength.	Ratio per 1,000 of mean strength.			
		Admissions.	Discharges.	Deaths.	Constantly noneffective.
Washington Barracks, D. C	351	1,903.13	11.40	2.85	31.12
Fort Myer, Va	284	1,496.48	10.56	3.52	22.22
Fort Clark, Tex	371	1,328.84	21.56	.....	25.24
Camp Eagle Pass, Tex	68	1,147.06	14.71	.....	26.55
Fort Slocum, N. Y	194	1,103.10	10.31	.....	26.15
Watervliet Arsenal, N. Y	60	1,100.00	.....	.....	31.42
Fort Monroe, Va	531	1,090.39	5.65	1.88	26.78
West Point, N. Y	381	1,084.00	10.50	.....	20.02
Fort Huachuca, Ariz	253	1,055.83	7.91	11.86	24.77
Fort D. A. Russell, Wyo	463	1,036.72	6.48	.....	21.88
Jefferson Barracks, Mo	345	1,023.19	17.39	17.39	41.47
Fort Wingate, N. Mex	212	1,018.87	14.15	4.72	26.29
Rock Island Arsenal, Ill	66	1,015.15	.....	15.15	15.57
Fort Washakie, Wyo	126	912.69	.....	7.94	14.78
Fort Barrancas, Fla	134	910.44	.....	.....	32.63
Fort Thomas, Ky	483	884.06	22.77	2.07	28.46
Fort Logan, Colo	580	862.08	3.45	5.17	21.16
Fort McIntosh, Tex	119	840.34	8.40	8.40	32.70
Fort Riley, Kans	826	813.57	8.47	1.21	17.78
St. Francis Barracks, Fla	156	807.69	12.82	12.82	26.08
The Army	25,119	699.01	8.13	3.52	18.89

TABLE X.—*Twenty posts having the highest noneffective rates for disease, excluding venereal diseases, vaccinia, and alcoholism; also the average number sick daily, the average duration of each case, and the corresponding average rates of the Army, year 1896.*

Name of station.	Mean strength.	Constantly noneffective, per 1,000 of mean strength.	Average number of sick daily.	Average number of days each case was treated.
Jefferson Barracks, Mo	345	41.47	14.30	14.83
Fort McIntosh, Tex	119	32.70	3.89	14.24
Fort Barrancas, Fla	134	32.63	4.37	13.12
Watervliet Arsenal, N. Y	60	31.42	1.89	10.45
San Diego Barracks, Cal	64	31.24	2.00	18.30
Washington Barracks, D. C	351	31.12	10.92	5.98
Fort Brady, Mich	256	29.23	7.48	18.50
Fort Thomas, Ky	483	28.46	13.74	11.78
Fort Brown, Tex	111	26.98	2.99	14.23
Fort Monroe, Va	531	26.78	14.22	8.99
Camp Eagle Pass, Tex	68	26.55	1.81	8.47
Fort Wingate, N. Mex	212	26.29	5.57	9.44
Fort Slocum, N. Y	194	26.15	5.07	8.68
St. Francis Barracks, Fla	156	26.08	4.07	11.82
Fort Snelling, Minn	483	25.93	12.52	15.38
Fort Clark, Tex	371	25.24	9.37	6.96
Columbus Barracks, Ohio	468	25.09	11.74	11.64
Fort McPherson, Ga	532	24.77	13.18	13.63
Fort Huachuca, Ariz	253	24.77	6.27	8.59
Fort Crook, Nebr	497	24.48	12.16	12.18
The Army	25,119	18.89	474.18	9.88

TABLE XI.—*The military posts in each department, showing the rates of admission, death, discharge, and constant noneffectiveness for disease, excluding venereal diseases, vaccinia, and alcoholism, year 1896.*

DEPARTMENT OF THE EAST.

Name of station.	Mean strength.	Ratio per 1,000 of mean strength.			
		Admissions.	Discharges.	Deaths.	Constantly noneffective.
Washington Barracks, D. C	351	1,903.13	11.40	2.85	31.12
Fort Myer, Va	284	1,496.48	10.56	3.52	22.22
Fort Slocum, N. Y	194	1,103.10	10.31	.....	26.15
Watervliet Arsenal, N. Y	60	1,100.00	.....	.....	31.42
Fort Monroe, Va	531	1,090.39	5.65	1.88	26.78
West Point, N. Y	381	1,084.00	10.50	.....	20.02
Columbia Arsenal, Tenn	19	1,000.00	.....	.....	21.71
Springfield Armory, Mass	37	945.94	.....	.....	14.48
Fort Barrancas, Fla	134	910.44	.....	.....	32.63
Fort Thomas, Ky	483	884.06	22.77	2.07	28.46
St. Francis Barracks, Fla	156	807.69	12.82	12.82	26.08
Kennebec Arsenal, Me	15	800.00	.....	.....	14.39
Fort Niagara, N. Y	201	796.02	.....	4.98	22.71
Willets Point, N. Y	409	794.62	.....	.....	15.47
Fort Columbus, N. Y	235	791.48	17.02	.....	18.52
Fort McHenry, Md	186	790.32	.....	5.38	17.63
Columbus Barracks, Ohio	468	788.46	6.41	4.27	25.09
Watertown Arsenal, Mass	40	775.00	.....	.....	25.90
Fort Hamilton, N. Y	268	764.93	7.46	.....	18.75
Fort Schuyler, N. Y	117	726.49	8.55	.....	13.05
Fort Warren, Mass	131	725.19	7.63	7.63	19.89
Augusta Arsenal, Ga	29	724.14	.....	.....	41.17
Sandy Hook Proving Ground, N. J	65	707.69	15.38	.....	4.87
Key West Barracks, Fla	132	674.24	.....	.....	13.56
Madison Barracks, N. Y	476	672.27	8.40	6.30	16.53
Fort McPherson, Ga	532	665.42	11.28	7.52	24.77
Fort Ethan Allen, Vt	223	632.28	.....	13.45	20.40
Jackson Barracks, La	145	606.90	6.90	.....	13.26
Frankford Arsenal, Pa	45	600.00	.....	.....	14.81
Plattsburg Barracks, N. Y	517	568.65	1.93	3.87	10.97
Fort Wadsworth, N. Y	201	547.23	9.95	9.95	15.04
Allegheny Arsenal, Pa	32	531.25	.....	31.25	4.78
Fort Adams, R. I	285	501.76	3.51	.....	13.84
Fort Preble, Me	67	358.21	.....	.....	4.52
Fort Porter, N. Y	115	278.26	.....	8.70	8.56
Fort Trumbull, Conn	68	250.00	.....	.....	8.51
New York attending surgeon, N. Y	20	200.00	.....	50.00	6.42
Philadelphia attending surgeon, Pa	11	181.82	.....	.....	15.90
Boston attending surgeon, Mass	26	38.46	.....	.....	.42
Baltimore attending surgeon, Md	10	.....	.....	.....	.....
Field	281	1,195.72	.....	.....	11.13
Total	7,980	849.00	7.14	3.51	19.99

DEPARTMENT OF THE MISSOURI.

Indianapolis Arsenal, Ind	25	1,600.00	.....	.....	21.31
Jefferson Barracks, Mo	345	1,023.19	17.39	17.39	41.47
Rock Island Arsenal, Ill	66	1,015.15	.....	15.15	15.57
Fort Riley, Kans	826	813.57	8.47	1.21	17.78
Fort Sill, Okla	406	704.42	4.93	7.39	18.39
Fort Leavenworth, Kans	758	610.82	7.92	3.96	14.80
Fort Sheridan, Ill	738	582.64	5.42	2.71	14.32
Fort Brady, Mich	256	578.13	11.72	11.72	29.23
Fort Reno, Okla	352	423.31	8.52	.....	15.64
Little Rock, Ark	64	312.50	15.62	.....	19.34
Fort Wayne, Mich	250	276.00	8.00	.....	8.96
Chicago headquarters, Ill	25	200.00	.....	.....	20.44
Field	187	641.70	.....	.....	6.66
Total	4,298	656.58	7.91	4.42	18.16

TABLE XI.—*The military posts in each department, showing the rates of admission, death, discharge, and constant noneffectiveness for disease, etc.*—Continued.

DEPARTMENT OF DAKOTA.

Name of station.	Mean strength.	Ratio per 1,000 of mean strength.			
		Admissions.	Discharges.	Deaths.	Constantly noneffective.
Fort Keogh, Mont	286	695.80	17.48	6.99	19.57
Fort Yates, N. Dak	214	682.25	.....	4.67	24.21
Fort Snelling, Minn	483	616.98	16.56	.....	25.93
Fort Custer, Mont	342	505.84	17.54	2.92	20.69
Fort Missoula, Mont	272	404.42	18.38	3.68	16.38
Fort Harrison, Mont	124	370.96	8.06	.....	12.89
Fort Assiniboine, Mont	431	320.19	.....	2.32	9.77
Fort Yellowstone, Wyo	108	250.00	.....	.....	3.29
Saint Paul headquarters, Minn	30	.....	.....	.....	.....
Field	152	282.89	.....	.....	4.81
Total	2,442	483.21	10.24	2.46	17.09

DEPARTMENT OF THE PLATTE.

Fort D. A. Russell, Wyo	463	1,036.72	6.48	.....	21.58
Fort Washakie, Wyo	126	912.69	.....	7.94	14.78
Fort Niobrara, Nebr	502	788.85	1.99	3.98	17.99
Fort Crook, Nebr	497	738.44	10.06	4.02	24.48
Fort Robinson, Nebr	379	670.19	13.19	10.55	14.76
Fort Meade, S. Dak	456	559.22	4.39	2.19	15.33
Omaha headquarters, Nebr	10	300.00	.....	.....	15.30
Field	96	343.75	.....	.....	3.04
Total	2,529	752.48	6.72	3.55	18.28

DEPARTMENT OF TEXAS.

Fort Clark, Tex	371	1,328.84	21.56	.....	25.24
Camp Eagle Pass, Tex	68	1,147.06	14.71	.....	26.55
Fort McIntosh, Tex	119	840.34	8.40	8.40	32.70
Fort Brown, Tex	111	693.69	.....	.....	26.98
Fort Ringgold, Tex	126	690.48	.....	7.94	19.28
Fort Bliss, Tex	200	570.00	5.00	5.00	11.49
Fort Sam Houston, Tex	646	473.68	9.29	9.29	14.49
San Antonio headquarters, Tex	15	66.67	.....	66.67	13.75
Field	69	434.78	.....	.....	3.20
Total	1,725	745.50	9.85	5.80	18.77

DEPARTMENT OF THE COLORADO.

Fort Huachuca, Ariz	253	1,055.33	7.91	11.86	24.77
Fort Wingate, N. Mex	212	1,018.87	14.15	4.72	26.29
Fort Logan, Colo	580	862.08	3.45	5.17	21.16
Fort Grant, Ariz	294	755.11	10.20	3.40	17.91
San Carlos, Ariz	46	695.65	.....	.....	12.06
Fort Bayard, N. Mex	354	646.90	2.82	.....	13.28
Fort Douglas, Utah	508	620.08	3.94	.....	16.77
Whipple Barracks, Ariz	210	500.01	23.81	4.76	19.27
Fort Du Chesne, Utah	120	475.00	8.33	8.33	17.86
Fort Apache, Ariz	325	360.01	6.15	.....	12.62
Denver headquarters, Colo	16	62.50	.....	.....	.85
Field	154	545.46	.....	6.49	6.44
Total	3,072	698.25	6.84	3.58	17.72

TABLE XI.—*The military posts in each department, showing the rates of admission, death, discharge, and constant noneffectiveness for disease, etc.*—Continued.

DEPARTMENT OF CALIFORNIA.

Name of station.	Mean strength.	Ratio per 1,000 of mean strength.			
		Admissions.	Discharges.	Deaths.	Constantly noneffective.
San Diego Barracks, Cal	64	625.01	46.87	.....	31.24
Presidio of San Francisco, Cal	559	572.44	8.94	1.79	14.09
Angel Island, Cal	256	312.50	.....	.....	10.92
Benicia Barracks, Cal	209	296.65	9.57	4.78	6.22
Fort Mason, Cal	73	260.27	.....	.....	6.25
Alcatraz Island, Cal	134	238.80	.....	.....	10.06
San Francisco headquarters, Cal	28	107.14	.....	.....	5.07
Field	216	476.86	.....	.....	8.60
Total	1,539	428.20	6.50	1.30	11.55

DEPARTMENT OF THE COLUMBIA.

Fort Sherman, Idaho	279	680.83	10.75	3.58	17.37
Fort Walla Walla, Wash	254	602.35	.....	.....	19.75
Boise Barracks, Idaho	116	586.21	.....	.....	18.11
Fort Spokane, Wash	167	520.96	5.99	.....	13.80
Vancouver Barracks, Wash	568	438.38	7.04	.....	12.07
Fort Canby, Wash	94	436.16	.....	.....	11.98
Field	13	76.92	.....	.....	1.05
Total	1,491	519.78	5.37	.67	14.93

GENERAL HOSPITAL AND TOTAL FOR ARMY.

General hospital, Hot Springs, Ark	43	325.58	.....	.....	.....
Total for the Army	25.119	699.01	8.13	3.52	18.89

TABLE XII.—*Ratios of admission to sick report, discharge, death, and constantly noneffective of the Army and of the troops in the several departments for the year 1896, as compared with the ratios for the Army for 1895, and for the decade 1885–1894.*

For the decade 1885–1894.	White.				Negro.				Indian.				Total.			
Mean strength	A. G., 24,139.		S. G., 21,946.		A. G., 2,415.		S. G., 2,206.		A. G., 227.		S. G., 213.		A. G., 26,781.		S. G., 24,365.	
Causes of admission to sick report.	Admissions.	Discharges.	Deaths.	Constantly noneffective. (a)	Admissions.	Discharges.	Deaths.	Constantly noneffective. (a)	Admissions. (b)	Discharges. (b)	Deaths. (b)	Constantly noneffective. (b)	Admissions.	Discharges.	Deaths.	Constantly noneffective. (a)
SPECIAL.																
Vaccinia	32.58	0.004	.....	1.12	26.79	.....	.....	0.82	106.25	.....	.....	4.14	32.70	0.004	.....	1.12
Typhoid fever	5.90	.02	0.64	.93	2.18	.....	0.50	.31	.47	.....	.....	.02	5.51	.02	0.62	.86
Malarial infections	99.34	.10	.15	2.57	76.15	0.04	.41	1.89	32.91	.....	.....	.47	96.67	.09	.17	2.48
Rheumatic fever	5.07	.07	.02	.60	5.53	.04	.04	.54	4.23	0.44	.....	.58	5.10	.07	.03	.59
Tuberculosis of the lungs	2.95	1.61	.46	.72	3.99	1.90	.87	1.04	25.39	11.44	7.04	3.55	3.24	1.72	.55	.77
Syphilis	18.91	2.34	.01	1.74	21.76	3.52	.....	2.07	15.51	2.64	.....	1.76	19.14	2.45	.01	1.77
Gonorrhea	37.94	.29	.....	2.19	33.41	.08	.....	1.54	63.00	.....	.....	3.17	37.74	.27	.....	2.14
All venereal diseases	76.34	2.73	.01	5.22	80.64	3.60	.....	5.40	98.26	2.64	.....	5.77	76.92	2.80	.01	5.24
Alcoholism and direct results	45.07	.12	.23	.47	4.62	.04	.....	.04	4.70	.....	.....	.07	41.04	.11	.21	.42
Neuralgia	27.33	.17	.....	.64	39.62	.04	.....	.60	15.05	.....	.....	.17	28.34	.15	.....	.63
Tonsillitis	41.55	.004	.01	.65	55.75	.....	.....	.74	29.62	.....	.....	.41	42.73	.004	.01	.66
Colic and constipation	33.80	.02	.....	.29	50.54	.04	.....	.41	31.50	.....	.....	.34	35.29	.02	.....	.30
Diarrheal diseases	123.14	.27	.15	1.41	113.91	.17	.12	1.21	45.61	.....	.....	.55	121.64	.25	.14	1.38
Diseases of the heart	6.01	1.45	.41	.53	5.17	1.37	.25	.31	2.35	.88	.44	.16	5.91	1.44	.40	.51
Coryza	39.64	.....	.....	.31	49.54	.....	.....	.32	12.69	.....	.....	.11	40.30	.....	.....	.31
Bronchitis	68.52	.26	.04	1.44	71.34	.17	.....	1.26	56.89	.....	.....	.82	68.67	.25	.03	1.41
Pneumonia	3.96	.07	.68	.43	6.93	.08	1.49	.64	10.34	.....	.88	.70	4.28	.07	.76	.45
Diseases of the kidneys	1.80	.21	.27	.22	2.90	.29	.37	.23	.....	.....	.....	.....	1.89	.21	.28	.21
Rheumatism and myalgia	75.79	1.80	.03	3.76	117.44	2.15	.04	4.76	50.78	1.32	.....	1.54	79.33	1.83	.03	3.82
Boils and abscesses	43.62	.02	.004	1.00	28.15	.08	.....	.70	42.31	.....	.....	1.21	42.20	.02	.004	.97
Conjunctivitis	12.10	.09	.....	.33	15.23	.21	.....	.46	44.67	.....	.....	1.21	12.67	.10	.....	.35
All diseases of the eye	18.40	1.12	.....	.81	26.92	1.20	.....	1.06	62.06	.44	.....	1.98	19.51	1.12	.....	.84
All diseases of the ear	8.03	.60	.01	.34	3.76	.12	.....	.17	8.46	.....	.44	.16	7.65	.55	.01	.33
Contusions and sprains	130.22	.26	.01	3.31	147.85	.25	.04	3.47	128.82	.....	.....	3.02	131.79	.26	.01	3.32
Dislocations	2.51	.12	.....	.20	2.13	.12	.....	.11	6.11	.....	.....	.52	2.50	.12	.....	.20
Fractures, not gunshot	6.85	.55	.10	1.18	5.21	.25	.08	.81	11.75	.....	1.76	1.52	6.75	.52	.11	1.15
Wounds, not gunshot	49.52	.19	.07	1.49	69.39	.21	.08	2.01	91.20	.....	.....	2.10	51.68	.19	.07	1.54
Wounds, gunshot	3.56	.65	1.01	.58	7.98	.95	1.66	1.03	7.05	.88	4.84	1.05	3.99	.68	1.10	.62
GROUPED.																
Infectious diseases, general and local	300.36	4.68	1.72	13.37	287.42	6.04	2.44	12.19	350.26	15.41	7.04	17.45	299.62	4.89	1.83	13.31
Diseases of nutrition, general	2.68	.65	.10	.25	1.99	.46	.....	.17	1.41	.....	.44	.03	2.61	.62	.09	.24

Diseases of the nervous system	104.55	3.46	.83	2.37	83.31	2.69	.41	1.64	41.38	1.32	.44	.68	102.08	3.38	.79	2.28
Diseases of the digestive system	287.28	.87	.67	4.50	316.61	.79	.37	4.18	180.54	.....	.....	2.57	289.00	.85	.64	4.45
Diseases of the circulatory system	7.31	1.79	.51	.70	5.57	1.49	.50	.37	2.35	.88	.44	.16	7.11	1.76	.50	.66
Diseases of the respiratory organs	119.94	.64	.81	2.58	142.51	.37	1.74	2.67	92.15	1.32	.88	2.46	121.74	.62	.90	2.59
Diseases of the genito-urinary system	11.83	.96	.28	.90	14.78	1.08	.37	.95	7.99	.44	.....	.21	12.07	.96	.28	.89
Diseases of the lymphatic system and ductless glands	5.60	.08	.004	.46	7.03	.04	.04	.51	11.28	.....	.....	.93	5.78	.07	.01	.47
Diseases of the muscles, bones, and joints	81.76	2.97	.01	3.84	123.15	3.44	.04	5.09	53.60	1.76	.....	1.38	85.28	3.00	.01	3.93
Diseases of the integument and subcutaneous connective tissue	79.24	.28	.02	2.13	52.26	.33	.08	1.59	71.93	.....	.....	2.19	76.73	.28	.02	2.08
Diseases of the organs of special sense	28.23	1.86	.01	1.30	31.82	1.45	.....	1.29	72.40	.44	.44	2.19	28.94	1.81	.01	1.31
Unclassified	2.80	.....	.004	.08	5.80	.....	.....	.09	2.82	.....	.....	.01	3.07	.....	.004	.08
General injuries	2.86	.03	1.02	.06	1.13	.04	.50	.03	.....	.....	.44	.....	2.68	.03	.97	.06
Injuries to special parts	243.03	3.48	1.33	8.46	295.26	3.60	2.03	9.52	302.30	2.64	6.60	9.76	248.27	3.48	1.44	8.57
Total for diseases	1,031.57	18.23	4.97	32.47	1,072.25	18.18	6.00	30.73	888.11	21.57	9.68	30.27	1,034.00	18.26	5.10	32.29
Total for injuries	245.89	3.51	2.35	8.52	296.39	3.64	2.53	9.55	302.30	2.64	7.04	9.76	250.95	3.51	2.41	8.63
Total for all causes	1,277.46	21.74	7.32	40.99	1,368.64	21.82	8.53	40.27	1,190.41	24.21	16.73	40.03	1,284.95	21.77	7.51	40.92

a For 1887–1894, eight years of decade.

b For 1891–1894, four years of decade.

TABLE XII.—*Ratios of admission to sick report, discharge, death, and constantly noneffective, etc.*—Continued.

For the year 1895.	White.				Negro.				Total.			
Mean strength	A. G., 25,139.		S. G., 23,195.		A. G., 2,187.		S. G., 2,009.		A. G., 27,326.		S. G., 25,204.	
Causes of admission to sick report.	Admissions.	Discharges.	Deaths.	Constantly noneffective.	Admissions.	Discharges.	Deaths.	Constantly noneffective.	Admissions.	Discharges.	Deaths.	Constantly noneffective.
SPECIAL.												
Vaccinia	27.98	.....	.....	0.57	11.95	.....	.....	0.22	26.70	.....	.....	0.55
Typhoid fever	4.61	.....	0.52	.72	1.00	.....	.....	.11	4.32	.....	0.48	.67
Malarial infections	87.60	.....	.08	1.80	24.39	.....	.....	.44	82.56	.....	.07	1.70
Rheumatic fever	4.10	0.08	.....	.50	3.98	.....	.....	.39	4.09	0.07	.....	.49
Tuberculosis of the lungs	2.46	1.11	.36	.54	1.99	0.46	0.46	.33	2.42	1.06	.37	.52
Syphilis	10.91	.....	.08	1.23	13.94	.....	.46	1.59	11.15	.....	.11	1.26
Gonorrhea	47.68	.....	.....	3.08	26.88	.....	.....	1.36	46.02	.....	.....	2.94
All venereal diseases	75.57	.....	.08	5.40	52.26	.....	.46	3.48	73.72	.....	.11	5.24
Alcoholism and direct results	32.16	.....	.12	.47	6.47	.....	.....	.05	30.11	.....	.11	.44
Neuralgia	15.69	.08	.....	.52	21.40	.....	.....	.37	16.15	.07	.....	.51
Tonsillitis	41.60	.....	.....	.65	43.31	.....	.....	.59	41.74	.....	.....	.65
Colic and constipation	28.59	.....	.....	.26	49.78	.....	.....	.39	30.27	.....	.....	.27
Diarrheal diseases	88.08	.....	.08	.81	51.27	.....	.....	.50	85.14	.....	.07	.78
Diseases of the heart	4.61	1.19	.40	.53	2.49	.46	.....	.23	4.44	1.13	.37	.51
Coryza	17.03	.....	.....	.17	14.93	.....	.....	.15	16.86	.....	.....	.17
Bronchitis	55.31	.08	.....	.85	50.28	.....	.....	.62	54.91	.07	.....	.83
Pneumonia	2.97	.....	.48	.32	2.99	.....	.....	.22	2.98	.....	.44	.32
Diseases of the kidneys	.95	.16	.04	.19	1.00	.....	.46	.14	.95	.15	.07	.18
Rheumatism and myalgia	61.40	.44	.....	2.75	95.07	.46	.....	2.79	64.08	.44	.....	2.76
Boils and abscesses	44.92	.04	.....	.96	17.92	.....	.....	.45	42.77	.04	.....	.92
Conjunctivitis	10.99	.....	.....	.25	12.44	.....	.....	.36	11.11	.....	.....	.26
All diseases of the eye	15.69	.44	.....	.55	24.39	.46	.....	.90	16.39	.44	.....	.58
All diseases of the ear	6.64	.44	.....	.33	1.99	.....	.....	.03	6.27	.40	.....	.30
Contusions and sprains	138.18	.20	.....	3.41	117.97	.....	.....	2.27	136.57	.18	.....	3.32
Dislocations	3.28	.....	.04	.19	1.00	.....	.....	.14	3.09	.....	.04	.19
Fractures, not gunshot	8.15	.32	.04	1.28	4.98	.91	.....	1.47	7.89	.37	.04	1.29
Wounds, not gunshot	52.00	.28	.....	1.37	64.21	.46	.46	1.72	53.52	.29	.04	1.40
Wounds, gunshot	2.28	.68	.80	.46	3.48	.46	.46	.42	2.38	.66	.77	.46
GROUPED.												
Infectious diseases, general and local	274.50	1.47	1.55	11.45	136.88	.46	.91	5.84	263.53	1.39	1.50	11.00
Local infections (also entered under diseases of organs)	155.16	.16	.72	3.57	113.99	.....	.....	2.67	151.88	.15	.66	3.50
Diseases of nutrition, general	1.29	.16	.08	.08	1.00	.....	.46	.23	1.27	.15	.11	.09

Diseases of the nervous system	62.43	1.55	.36	1.91	36.84	.....	.....	.97	60.39	1.43	.33	1.84
Diseases of the digestive system	242.55	.16	.56	3.49	232.46	.....	.46	3.19	241.74	.15	.55	3.46
Diseases of the circulatory system	6.08	1.43	.40	.62	2.49	.46	.....	.23	5.79	1.35	.37	.59
Diseases of the respiratory organs	82.34	.28	.64	1.72	74.17	.....	.46	1.66	81.69	.26	.62	1.72
Diseases of the genito-urinary system	6.64	.24	.04	.49	6.97	.....	.46	.80	6.66	.22	.07	.52
Diseases of the lymphatic system and ductless glands	3.19	.04	.....	.33	2.49	.....	.....	.10	3.13	.04	.....	.31
Diseases of the muscles, bones, and joints	67.69	.80	.....	2.90	100.55	1.37	.....	3.07	70.30	.84	.....	2.91
Diseases of the integument and subcutaneous connective tissue	79.02	.12	.....	1.93	36.84	.....	.....	1.47	75.66	.11	.....	1.89
Diseases of the organs of special sense	24.53	.91	.....	1.04	27.38	.46	.....	.95	24.76	.88	.....	1.04
Unclassified	2.72	.....	.....	.05	1.00	.....	.....	.01	2.58	.....	.....	.05
General injuries	6.77	.....	.76	.18	8.46	.....	.46	.17	6.90	.....	.73	.18
Injuries to special parts	267.30	2.35	.88	8.34	248.38	2.29	.91	7.71	265.79	2.34	.88	8.29
Total for diseases	852.99	7.16	3.62	26.02	659.03	2.74	2.74	18.53	837.53	6.81	3.55	25.43
Total for injuries	274.07	2.35	1.63	8.52	256.84	2.29	1.37	7.88	272.69	2.34	1.61	8.46
Total for all causes	1,127.05	9.51	5.25	34.54	915.88	5.03	4.12	26.40	1,110.22	9.15	5.16	33.89

TABLE XII.—*Ratios of admission to sick report, discharge, death, and constantly noneffective, etc.*—Continued.

For the year 1896.	White.				Negro.				Total.			
Mean strength.	A. G., 24,977.		S. G., 23,014.		A. G., 2,206.		S. G., 2,105.		A. G., 27,183.		S. G., 25,119.	
Causes of admission to sick report.	Admissions.	Discharges.	Deaths.	Constantly noneffective.	Admissions.	Discharges.	Deaths.	Constantly noneffective.	Admissions.	Discharges.	Deaths.	Constantly noneffective.
SPECIAL.												
Vaccinia	26.03	.....	.....	0.64	7.60	.....	.....	0.16	24.49	.....	.....	0.60
Typhoid fever	6.04	.....	0.68	.88	4.28	.....	.....	.58	5.89	.....	0.63	.85
Malarial infections	89.16	0.04	.04	1.76	16.63	.....	.....	.49	83.08	0.04	.04	1.65
Rheumatic fever	4.26	.04	.....	.43	1.90	.....	.....	.27	4.06	.04	.....	.42
Tuberculosis of the lungs	1.52	1.08	.20	.36	2.38	3.17	0.45	.69	1.59	1.25	.22	.39
Syphilis	11.56	.....	.04	1.28	4.75	.....	.....	.38	10.98	.....	.04	1.31
Gonorrhea	51.71	.....	.....	3.13	35.63	.....	.....	1.84	50.36	.....	.....	3.02
All venereal diseases	80.04	.....	.04	5.46	56.53	.....	.....	3.18	78.08	.....	.04	5.26
Alcoholism and direct results	31.20	.....	.28	.53	5.70	.....	.....	.04	29.06	.....	.26	.49
Neuralgia	14.73	.08	.....	.31	19.00	.....	.....	.17	15.09	.07	.....	.30
Tonsillitis	39.37	.....	.....	.63	55.58	.....	.....	.78	40.73	.....	.....	.65
Colic and constipation	26.33	.....	.....	.23	31.35	.....	.....	.27	26.75	.....	.....	.23
Diarrheal diseases	82.86	.12	.....	.78	48.93	.....	.....	.34	80.02	.11	.....	.74
Diseases of the heart	3.95	.96	.40	.53	2.38	.....	1.36	.21	3.82	.88	.48	.51
Coryza	13.03	.....	.....	.14	8.08	.....	.....	.07	12.62	.....	.....	.13
Bronchitis	66.43	.08	.04	1.06	53.68	.....	.....	.82	65.37	.07	.04	1.04
Pneumonia	2.48	.....	.36	.22	4.28	.....	.....	.41	2.63	.....	.33	.24
Diseases of the kidneys	1.78	.16	.28	.22	.48	.....	.45	.12	1.67	.15	.29	.21
Rheumatism and myalgia	58.61	.96	.04	2.51	71.26	1.36	.....	2.35	59.68	.99	.04	2.50
Boils and abscesses	44.06	.....	.....	.82	19.48	.....	.....	.65	42.00	.....	.....	.80
Conjunctivitis	8.56	.....	.....	.19	13.78	.....	.....	.30	9.00	.....	.....	.20
All diseases of the eye	14.21	.44	.....	.55	22.80	.91	.....	.67	14.93	.48	.....	.56
All diseases of the ear	6.08	.48	.....	.28	3.33	.45	.....	.13	5.85	.48	.....	.27
Contusions and sprains	149.04	.08	.04	3.43	124.47	.....	.....	2.11	146.98	.07	.04	3.32
Dislocations	3.82	.....	.....	.21	.95	.....	.....	.06	3.58	.....	.....	.20
Fractures, not gunshot	7.73	.32	.24	1.29	7.13	.....	.45	1.28	7.68	.29	.26	1.29
Wounds, not gunshot	49.66	.20	.04	1.35	47.03	.45	.....	1.43	49.45	.22	.04	1.36
Wounds, gunshot	2.09	.40	.44	.40	2.38	.....	1.36	.08	2.11	.37	.52	.37
GROUPED.												
Infectious diseases, general and local	275.70	1.32	1.32	11.40	158.24	4.08	.91	7.06	265.85	1.55	1.29	11.04
Local infections (also entered under diseases of organs)	164.90	.36	.48	3.58	136.82	.....	.45	2.59	162.55	.33	.52	3.49
Diseases of nutrition, general	2.69	.40	.12	.25	1.43	.91	.....	.06	2.59	.44	.11	.24

Diseases of the nervous system	61.22	1.48	.72	1.94	34.21	.45	.91	1.17	58.96	1.40	.74	1.88
Diseases of the digestive system	235.12	.44	.36	3.44	208.55	.45	.91	3.11	232.89	.44	.40	3.41
Diseases of the circulatory system	5.13	1.16	.48	.60	3.33	.....	1.36	.31	4.98	1.07	.55	.58
Diseases of the respiratory organs	87.60	.40	.40	1.76	70.78	.....	.....	1.41	86.19	.37	.37	1.73
Diseases of the genito-urinary system	8.69	.36	.32	.65	8.55	.....	.45	.66	8.68	.33	.33	.65
Diseases of the lymphatic system and ductless glands	3.30	.04	.....	.27	1.43	.....	.....	.12	3.15	.04	.....	.26
Diseases of the muscles, bones, and joints	64.44	1.48	.04	2.69	77.41	1.81	.....	2.45	65.53	1.51	.04	2.66
Diseases of the integument and subcutaneous connective tissue	80.60	.04	.....	1.85	34.68	.....	.....	1.00	76.76	.04	.....	1.78
Diseases of the organs of special sense	22.07	.92	.....	.95	28.03	1.36	.....	.85	22.57	.96	.....	.94
Unclassified	2.48	.....	.....	.05	2.85	.....	.....	.16	2.51	.....	.....	.06
General injuries	7.04	.....	.60	.09	4.28	.....	.91	.06	6.81	.....	.63	.09
Injuries to special parts	276.40	2.08	.92	8.77	235.16	1.36	1.81	7.33	272.94	2.02	.99	8.65
Total for diseases	849.05	8.05	3.76	25.87	629.45	9.07	4.53	18.35	830.65	8.13	3.83	25.23
Total for injuries	283.44	2.08	1.52	8.86	239.43	1.36	2.72	7.40	279.75	2.02	1.62	8.73
Total for all causes	1,132.49	10.13	5.28	34.72	868.88	10.43	7.25	25.75	1,110.39	10.15	5.44	33.97

TABLE XII.—*Ratios of admission to sick report, discharge, death, and constantly noneffective, etc.*—Continued.

For the year 1896.	Department of the East.				Department of the Missouri.				Department of Dakota.				Department of the Platte.			
Mean strength	7,980				4,298				2,442				2,529			
Causes of admission to sick report.	Admissions.	Discharges.	Deaths.	Constantly noneffective.	Admissions.	Discharges.	Deaths.	Constantly noneffective.	Admissions.	Discharges.	Deaths.	Constantly noneffective.	Admissions.	Discharges.	Deaths.	Constantly noneffective.
SPECIAL.																
Vaccinia	20.55	.....	.....	0.68	38.85	.....	.....	0.74	17.20	.....	.....	0.27	7.51	.....	.....	0.15
Typhoid fever	3.88	.....	0.75	.48	11.17	.....	1.63	2.04	4.09	.....	0.41	.61	2.77	.....	.....	.33
Malarial infections	175.18	0.13	.13	2.73	80.04	.....	.....	2.19	18.43	.....	.....	.34	24.91	.....	.....	.75
Rheumatic fever	3.88	.13	.....	.39	3.96	.....	.....	.42	4.91	.....	.....	.51	2.77	.....	.....	.43
Tuberculosis of the lungs	1.75	1.25	.25	.35	.93	0.70	.23	.21	1.64	2.46	.....	.40	1.58	1.58	.....	.35
Syphilis	11.28	.....	.....	1.15	13.96	.....	.....	1.59	5.73	.....	.....	.62	7.51	.....	.....	.58
Gonorrhea	46.49	.....	.....	2.84	75.85	.....	.....	4.56	34.81	.....	.....	2.12	48.64	.....	.....	2.76
All venereal diseases	73.44	.....	.....	4.90	115.87	.....	.....	7.82	51.19	.....	.....	3.45	71.17	.....	.....	4.34
Alcoholism and direct results	35.96	.....	.13	.49	20.48	.....	.70	.44	17.61	.....	.....	.20	40.73	.....	0.40	1.00
Neuralgia	17.17	.13	.....	.36	10.47	.....	.....	.17	11.47	.....	.....	.15	18.58	.....	.....	.32
Tonsillitis	35.59	.....	.....	.58	30.71	.....	.....	.46	34.40	.....	.....	.57	94.50	.....	.....	1.48
Colic and constipation	32.96	.....	.....	.30	20.94	.....	.....	.20	17.20	.....	.....	.21	41.91	.....	.....	.30
Diarrheal diseases	103.38	.....	.....	1.03	74.45	.70	.....	.81	42.18	.....	.....	.34	49.43	.....	.....	.41
Diseases of the heart	3.26	.38	.63	.51	2.56	1.16	.23	.38	2.05	.41	.....	.51	3.95	1.19	.79	.37
Coryza	17.42	.....	.....	.19	4.65	.....	.....	.04	11.88	.....	.....	.10	18.98	.....	.....	.21
Bronchitis	84.84	.13	.13	1.32	56.77	.....	.....	1.00	40.54	.41	.....	.82	80.27	.....	.....	1.22
Pneumonia	2.51	.....	.50	.24	2.79	.....	.47	.19	2.87	.....	.....	.32	4.35	.....	.....	.45
Diseases of the kidneys	2.13	.....	.....	.23	2.09	.47	.47	.25	1.64	.....	.41	.06	1.58	.....	.40	.06
Rheumatism and myalgia	57.89	1.25	.....	2.23	59.33	.93	.....	1.88	54.47	1.23	.....	1.99	75.92	.40	.....	2.82
Boils and abscesses	42.23	.....	.....	.78	61.42	.....	.....	1.09	22.52	.....	.....	.51	35.59	.....	.....	.86
Conjunctivitis	7.39	.....	.....	.16	8.14	.....	.....	.18	6.55	.....	.....	.15	17.40	.....	.....	.28
All diseases of the eye	10.90	.38	.....	.39	14.42	.70	.....	.43	17.20	1.23	.....	1.06	25.70	.40	.....	1.03
All diseases of the ear	5.89	.38	.....	.25	6.75	.47	.....	.31	6.96	1.23	.....	.30	8.70	.40	.....	.42
Contusions and sprains	131.15	.13	.....	2.84	182.18	.....	.....	4.42	107.70	.....	.....	2.60	190.19	.....	.....	3.68
Dislocations	4.26	.....	.....	.20	3.49	.....	.....	.19	1.64	.....	.....	.06	1.58	.....	.....	.07
Fractures, not gunshot	6.14	.25	.38	1.10	8.61	.93	.....	1.49	6.96	.41	.....	1.54	7.91	.....	.40	1.77
Wounds, not gunshot	55.39	.....	.....	1.46	53.05	.....	.....	1.33	42.18	.....	.....	1.13	47.05	.....	.....	1.34
Wounds, gunshot	.88	.....	.13	.10	1.86	.....	.23	.20	2.46	1.23	1.23	.69	2.77	40.	1.19	.41
GROUPED.																
Infectious diseases, general and local	350.88	1.50	1.63	11.51	306.65	.93	2.09	15.17	159.30	2.87	.82	7.37	183.86	1.58	.....	8.17
Local infections (also entered under diseases of organs)	177.32	.13	.38	3.73	160.07	.47	.47	3.31	109.75	.....	.....	3.25	223.01	.79	.40	4.35

Diseases of nutrition, general	3.13	.50	.25	.25	2.09	.23	.23	.24	2.87	.82	.....	.34	1.98	.79	.....	.08
Diseases of the nervous system	70.05	1.00	.50	1.92	41.88	.23	1.40	1.19	38.50	.82	.41	1.45	85.40	.40	1.58	2.27
Diseases of the digestive system	256.64	.50	.....	3.54	208.70	1.16	.....	2.83	153.97	.41	.82	3.48	292.21	.40	.79	4.35
Diseases of the circulatory system	4.64	.63	.63	.58	3.26	1.40	.23	.41	3.69	.41	.....	.62	4.35	1.58	1.19	.41
Diseases of the respiratory organs	111.90	.63	.63	2.18	68.17	.23	.47	1.50	58.97	.41	.....	1.30	107.16	.40	.....	2.12
Diseases of the genito-urinary system	9.15	.....	.....	.54	8.61	.70	.70	.56	9.01	.....	.41	.93	10.28	.40	.40	.66
Diseases of the lymphatic system and ductless glands	4.51	.13	.....	.50	2.79	.....	.....	.16	2.46	.....	.....	.25	2.37	.....	.....	.10
Diseases of the muscles, bones, and joints	64.79	1.50	.....	2.34	64.91	1.86	.....	2.19	62.24	1.64	.....	2.23	78.29	.40	.....	2.50
Diseases of the integument and subcutaneous connective tissue	81.08	.....	.....	1.83	100.98	.....	.....	2.07	45.05	.41	.....	1.10	68.40	.....	.....	1.62
Diseases of the organs of special sense	18.30	.75	.....	.78	22.34	1.16	.....	.81	31.94	2.46	.....	1.85	35.19	.79	.....	1.45
Unclassified	3.88	.....	.....	.10	1.40	.....	.....	.03	1.23	.....	.....	.11	2.37	.....	.....	.03
General injuries	9.27	.....	.75	.12	5.35	.....	.47	.04	3.69	.....	.82	.06	3.95	.....	.40	.03
Injuries to special parts	258.15	1.13	.50	7.40	321.54	3.02	.70	10.03	209.25	2.05	1.64	8.43	327.01	2.37	1.58	10.31
Total for diseases	978.95	7.14	3.63	26.06	831.78	7.91	5.12	27.16	569.21	10.24	2.46	21.01	871.89	6.72	3.95	23.77
Total for injuries	267.42	1.13	1.25	7.59	326.90	3.02	1.16	10.07	212.94	2.05	2.46	8.49	330.96	2.37	1.98	10.34
Total for all causes	1,246.37	8.27	4.89	33.65	1,158.68	10.93	6.28	37.23	782.15	12.29	4.91	29.50	1,202.85	9.09	5.93	34.11

TABLE XII.—*Ratios of admission to sick report, discharge, death, and constantly noneffective, etc.*—Continued.

For the year 1896.	Department of Texas.				Department of the Colorado.				Department of California.				Department of the Columbia.			
Mean strength	1,725.				3,072.				1,539.				1,491.			
Causes of admission to sick report.	Admissions.	Discharges.	Deaths.	Constantly noneffective.	Admissions.	Discharges.	Deaths.	Constantly noneffective.	Admissions.	Discharges.	Deaths	Constantly noneffective.	Admissions.	Discharges.	Deaths.	Constantly noneffective.
SPECIAL.																
Vaccinia	35.36	.....	.....	0.80	29.95	.....	.....	0.86	12.35	.....	.....	0.23	34.21	.....	.....	0.72
Typhoid fever	16.23	.....	0.58	1.65	5.53	.....	0.33	.86	.65	.....	.....	.14	2.68	.....	0.67	.26
Malarial infections	34.78	.....	.....	.79	29.62	.....	.....	1.15	33.79	.....	.....	1.00	22.80	.....	.....	.47
Rheumatic fever	4.06	.....	.....	.41	5.86	.....	.....	.45	1.30	.....	.....	.14	5.37	.....	.....	.63
Tuberculosis of the lungs	2.90	2.90	.....	.61	1.63	0.98	.33	.63	1.30	.....	.....	.26	1.34	2.01	.....	.50
Syphilis	13.33	.....	.....	1.98	11.72	.....	.....	1.17	16.24	.....	.....	1.51	4.69	.....	.....	.77
Gonorrhea	57.97	.....	.....	3.41	45.25	.....	.....	2.50	45.49	.....	.....	2.87	32.86	.....	.....	2.13
All venereal diseases	98.55	.....	.....	7.45	69.33	.....	.....	4.24	77.32	.....	.....	5.25	44.27	.....	.....	3.28
Alcoholism and direct results	27.25	.....	1.16	.36	22.46	.....	.....	.23	25.99	.....	.....	.26	35.55	.....	.....	.36
Neuralgia	20.87	.....	.....	.28	16.28	.....	.....	.28	11.05	.....	.....	.30	12.07	.....	.....	.30
Tonsillitis	15.07	.....	.....	.22	60.88	.....	.....	.94	11.05	.....	.....	.18	36.22	.....	.....	.64
Colic and constipation	29.57	.....	.....	.29	26.37	.....	.....	.19	8.45	.....	.....	.04	17.44	.....	.....	.13
Diarrheal diseases	125.22	.....	.....	.90	91.80	.....	.....	.85	46.13	.....	.....	.32	45.61	.....	.....	.31
Diseases of the heart	5.22	.58	.....	.27	6.18	2.28	.98	.58	7.15	0.65	0.65	.79	3.35	.67	.....	.51
Coryza	13.33	.....	.....	.13	7.49	.....	.....	.07	1.30	.....	.....	.02	21.46	.....	.....	.25
Bronchitis	45.22	.....	.....	.59	71.29	.....	.....	1.06	45.49	.....	.....	.62	34.88	.....	.....	.60
Pneumonia	1.74	.....	.....	.11	1.95	.....	.65	.14	.65	.....	.....	.06	4.02	.....	.....	.39
Diseases of the kidneys	1.16	.....	.58	.09	.98	.33	.33	.39	1.30	.65	.65	.12	.67	.....	.....	.01
Rheumatism and myalgia	56.82	1.74	.....	2.00	73.24	.33	.....	2.03	34.44	.65	.....	1.35	50.31	.....	.....	1.94
Boils and abscesses	88.70	.....	.....	1.56	31.25	.....	.....	.66	13.65	.....	.....	.25	26.16	.....	.....	.52
Conjunctivitis	6.96	.....	.....	.20	10.09	.....	.....	.30	5.85	.....	.....	.06	13.41	.....	.....	.39
All diseases of the eye	15.07	.....	.....	.46	16.28	.33	.....	.66	10.40	.65	.....	.25	18.11	.67	.....	.50
All diseases of the ear	5.22	.58	.....	.26	5.53	.98	.....	.34	1.95	.....	.....	.06	2.01	.....	.....	.05
Contusions and sprains	145.51	.....	.....	3.28	144.53	.....	.33	3.09	133.20	.....	.....	3.45	146.21	.....	.....	3.69
Dislocations	4.06	.....	.....	.29	3.26	.....	.....	.21	3.25	.....	.....	.29	7.38	.....	.....	.41
Fractures, not gunshot	13.33	.....	.....	1.27	9.77	.....	.65	1.16	3.25	.65	.65	.89	8.05	.....	.....	1.13
Wounds, not gunshot	44.64	.....	.....	1.00	49.80	1.95	.....	1.75	35.74	.....	.65	1.06	43.59	.....	.....	1.24
Wounds, gunshot	6.38	1.16	1.16	.85	3.26	.98	1.30	.51	.65	.....	.....	.17	2.01	.67	.....	1.08
GROUPED.																
Infectious diseases, general and local	278.26	3.48	2.32	14.19	216.15	.98	.98	9.65	199.48	.....	.....	8.42	167.00	2.01	.67	7.48
Local infections (also entered under diseases of organs)	172.75	.58	1.74	3.39	179.69	.65	.98	3.80	83.17	.....	.65	1.72	114.02	.67	.....	3.12

Diseases of nutrition, general	3.48	.....	.....	.46	3.26	.65	.....	.22	.65	.65	.....	.05	.67	.....	.....	.02
Diseases of the nervous system	67.83	.58	1.74	1.74	50.78	.65	.....	1.50	49.38	.65	.....	1.21	53.66	.....	.....	1.66
Diseases of the digestive system	255.66	.58	2.32	3.29	277.99	.....	.65	3.89	132.55	.....	.....	2.11	194.50	.....	.....	2.82
Diseases of the circulatory system	6.38	1.16	.....	.48	7.49	2.28	.98	.66	8.45	.65	.65	.85	4.69	.67	.....	.52
Diseases of the respiratory organs	64.35	.....	.....	.94	87.88	.....	.65	1.72	51.98	.65	.....	1.09	68.42	.67	.....	1.71
Diseases of the genito-urinary system	6.96	.58	.58	.35	8.46	.65	.33	.69	3.25	.65	.65	.46	11.40	.67	.....	1.13
Diseases of the lymphatic system and ductless glands	5.22	.....	.....	.35	2.28	.....	.....	.07	.65	.....	.....	.08	1.34	.....	.....	.02
Diseases of the muscles, bones, and joints	64.35	2.90	.....	2.30	76.83	.35	.....	1.94	43.54	2.60	.....	1.96	53.66	.67	.....	2.13
Diseases of the integument and subcutaneous connective tissue	132.76	.....	.....	2.52	61.20	.....	.....	1.60	39.64	.....	.....	.70	57.68	.....	.....	1.24
Diseases of the organs of special sense	20.87	.58	.....	.74	23.11	1.30	.....	1.02	13.65	.65	.....	.33	20.12	.67	.....	.54
Unclassified	.58	.....	.....	.03	4.56	.....	.....	.07	.65	.....	.....	.01	.67	.....	.....	.01
General injuries	12.75	.....	1.16	.25	9.77	.....	.33	.10	1.95	.....	.65	.05	.....	.....	1.34	.....
Injuries to special parts	284.06	1.16	1.16	8.78	287.76	4.88	2.28	8.96	216.37	.65	1.95	6.68	246.81	2.01	.....	9.49
Total for diseases	906.67	9.85	6.96	27.38	819.99	6.84	3.58	23.05	543.86	6.50	1.30	17.29	633.80	5.37	.67	19.29
Total for injuries	296.82	1.16	2.32	9.03	297.52	4.88	2.60	9.06	218.32	.65	2.60	6.73	246.81	2.01	1.34	9.49
Total for all causes	1,203.48	11.01	9.28	36.41	1,117.51	11.72	6.18	32.11	762.18	7.15	3.90	24.02	880.62	7.38	2.01	28.78

TABLE XIII.—*Distribution of certain important diseases at United States military posts during the year 1896.*

Name of station.	Scarlet fever.	Measles.	Smallpox.	Influenza.	Mumps.	Diphtheria.	Typhoid fever.	Erysipelas.	Tonsillitis.	Bronchitis.	Pneumonia.	Total.
Adams, Fort, R. I.				4	1			1	4	6	1	17
Alcatraz, Island, Cal.				3					2			5
Allegheny Arsenal, Pa.									3	1	1	5
Angel Island, Cal.	2			2					1	14		19
Apache, Fort, Ariz.									14	21	1	36
Assinniboine, Fort, Mont.				45					9	8		62
Augusta Arsenal, Ga.				6						1		7
Baltimore attending surgeon, Md.												
Barrancas, Fort, Fla.				12	17		3		2			34
Bayard, Fort, N. Mex.				22					68	22	2	114
Benicia Barracks, Cal.										15		15
Bliss, Fort, Tex.				22					7	2		31
Boise Barracks, Idaho				5				1	6	6		18
Boston attending surgeon, Mass.				1								1
Brady, Fort, Mich.		2		5			15	1	17	27	4	71
Brown, Fort, Tex.							5		1	3		9
Canby, Fort, Wash.									3	3		6
Chicago headquarters, Ill.				2			1					3
Clark, Fort, Tex.									9	34		43
Columbia Arsenal, Tenn.									1	1		2
Columbus Barracks, Ohio		20		6	1		1		20	78		126
Columbus, Fort, N. Y.		7		3		1			3	23		37
Crook, Fort, Nebr.		2		30		29	2		16	23	1	103
Custer, Fort, Mont.				8		13	7		5	14	3	50
D. A. Russell, Fort, Wyo.		5						7	71	76	1	160
Denver headquarters, Colo.				1								1
Douglas, Fort, Utah.							1		19	47		67
Du Chesne, Fort, Utah.									3	5		8
Eagle Pass, Camp, Tex.		1		1			2			6	1	11
Ethan Allen, Fort, Vt.		4			2		1		11	8	2	28
Frankford Arsenal, Pa.										1		1
Grant, Fort, Ariz.		1							21	27	1	50
Hamilton, Fort, N. Y.									17	2		19
Harrison, Fort, Mont.				3					4	3	1	11
Hot Springs general hospital, Ark.							2					2
Huachuca, Fort, Ariz.		1							15	25		41
Indianapolis Arsenal, Ind.				7					1	2		10
Jackson Barracks, La.		1							1			2
Jefferson Barracks, Mo.				59			10		10	22	1	102
Kennebec Arsenal, Me.				2						3		5
Keogh, Fort, Mont.		1		31			1		18	17		68
Key West Barracks, Fla.				2			2		1	3		8
Leavenworth, Fort, Kans.		25		2		1	1		11	32	1	73
Little Rock, Ark.		2		1			3		2			8
Logan, Fort, Colo.		1		117	1		12	2	13	23		169
Madison Barracks, N. Y.		2		5					40	59		106
Mason, Fort, Cal.									3	1		4
McHenry, Fort, Md.		2					2		10	6	1	21
McIntosh, Fort, Tex.		4		8			5		1	5		23
McPherson, Fort, Ga.		31		1	32		2		15	67	2	150
Meade, Fort, S. Dak.							2		29	35	4	70
Missoula, Fort, Mont.		6		3			1		6	7		23
Monroe, Fort, Va.				56			2	1	29	83	3	174
Myer, Fort, Va.		10		1			2		9	74		96
New York attending surgeon, N. Y.									1			1
Niagara, Fort, N. Y.				7			4		3	17		31
Niobrara, Fort, Nebr.				10	1	1	2		73	36		123
Omaha headquarters, Nebr.				2								2
Philadelphia attending surgeon, Pa.									1			1
Plattsburg Barracks, N. Y.		4		55	1		2		9	27		98
Porter, Fort, N. Y.					1				3		1	5
Preble, Fort, Me.									1	1		2
Presidio of San Francisco, Cal.				74			1		8	31		114
Reno, Fort, Okla.							2		3	18		23
Riley, Fort, Kans.		40		31			1	1	43	54		170
Ringgold, Fort, Tex.							5		1	18	1	25
Robinson, Fort, Nebr.		1		17			1		45	25	5	94
Rock Island Arsenal, Ill.				7				1		7	1	16
Saint Francis Barracks, Fla.		10								2		12
Saint Paul headquarters, Minn.												
Sam Houston, Fort, Tex.				41			11	3	7	8	1	71
San Antonio headquarters, Tex.												
San Carlos, Ariz.									2	1		3
San Diego Barracks, Cal.		2		11						2	1	16
Sandy Hook Proving Ground, N. J.									4	6		10

TABLE XIII.—*Distribution of certain important diseases at United States military posts during the year 1896*—Continued.

Name of station.	Scarlet fever.	Measles.	Smallpox.	Influenza.	Mumps.	Diphtheria.	Typhoid fever.	Erysipelas.	Tonsillitis.	Bronchitis.	Pneumonia.	Total.
San Francisco headquarters, Cal	....	....	....	.....	.....	....	.....	....	.....	.....	....	.....
Schuyler, Fort, N. Y	....	....	....	12	.....	....	.....	....	3	.....	....	15
Sheridan, Fort, Ill	....	1	....	14	1	....	2	....	36	57	2	113
Sherman, Fort, Idaho	....	....	....	2	3	....	2	....	18	18	4	47
Sill, Fort, Okla	....	....	....	.....	.....	....	8	....	4	17	....	29
Slocum, Fort, N. Y	....	....	....	.....	.....	....	1	....	8	30	....	39
Snelling, Fort, Minn	....	1	....	13	2	....	1	....	18	33	2	70
Spokane, Fort, Wash	....	....	....	20	.....	....	.....	....	9	1	....	30
Springfield Armory, Mass	....	....	....	.....	.....	....	.....	....	4	11	....	15
Thomas, Fort, Ky	....	26	....	3	1	....	1	....	41	35	1	108
Trumbull, Fort, Conn	....	....	....	.....	.....	....	1	....	1	1	....	3
Vancouver Barracks, Wash	....	4	....	9	.....	....	.....	1	12	20	2	48
Wadsworth, Fort, N. Y	....	....	....	.....	.....	....	2	....	4	10	1	17
Walla Walla, Fort, Wash	....	2	....	29	.....	....	2	1	6	4	....	44
Warren, Fort, Mass	....	....	....	3	.....	....	1	2	6	20	....	32
Washakie, Fort, Wyo	....	....	....	20	.....	....	.....	....	4	4	....	28
Washington Barracks, D. C	....	21	....	9	.....	....	1	....	3	31	5	70
Watertown Arsenal, Mass	....	....	....	1	.....	....	.....	1	1	.....	....	3
Watervliet Arsenal, N. Y	....	....	....	.....	.....	....	.....	....	6	18	....	24
Wayne, Fort, Mich	....	2	....	1	.....	....	2	....	5	4	2	16
West Point, N. Y	....	....	....	36	2	....	1	....	10	27	....	76
Whipple Barracks, Ariz	....	....	....	10	.....	....	1	....	8	14	1	34
Willets Point, N. Y	....	2	....	1	4	....	.....	....	7	21	....	35
Wingate, Fort, N. Mex	....	....	....	25	.....	....	2	3	22	31	....	83
Yates, Fort, N. Dak	....	....	....	.....	.....	2	.....	....	20	12	....	34
Yellowstone, Fort, Wyo	....	....	....	.....	.....	....	.....	1	4	2	1	8
Field	....	....	....	3	1	....	6	1	8	27	4	50
The Army	2	244	....	942	71	47	148	28	1,023	1,642	66	4,213

TABLE XIV.—*Twenty posts giving the highest admission rates for malarial diseases, rheumatism and diarrheal and venereal diseases, respectively, during 1896.*

I.—MALARIAL DISEASES.

Name of station.	Mean strength.	Ratio per 1,000 of mean strength.			
		Admissions.	Discharges.	Deaths.	Constantly non-effective.
Washington Barracks, D. C	351	1,071.22	.....	.....	9.82
Fort Myer, Va	284	644.37	3.52	.....	5.83
Jefferson Barracks, Mo	345	356.52	.....	.....	16.05
West Point, N. Y	381	317.59	.....	.....	3.94
Fort Slocum, N. Y	194	298.97	.....	.....	3.87
Fort Sill, Okla	406	290.64	.....	.....	4.42
Willets Points, N. Y	409	281.17	.....	.....	4.46
Fort Monroe, Va	531	235.40	.....	.....	4.84
Fort Wadsworth, N. Y	201	233.83	.....	.....	4.25
Fort Hamilton, N. Y	268	175.37	.....	.....	2.67
Fort Niagara, N. Y	201	129.35	.....	.....	3.71
Fort McHenry, Md	186	129.03	.....	.....	2.57
Watervliet Arsenal, N. Y	60	116.67	.....	.....	3.37
Saint Francis Barracks, Fla	156	115.38	.....	6.41	3.73
Fort Grant, Ariz	294	108.84	.....	.....	3.04
Rock Island Arsenal, Ill	66	106.06	.....	.....	.91
Fort Ringgold, Tex	126	103.17	.....	.....	1.67
Fort Brown, Tex	111	90.09	.....	.....	1.87
Jackson Barracks, La	145	89.66	.....	.....	1.13
Fort Thomas, Ky	483	72.47	.....	.....	1.71
The Army	25,119	83.08	.04	.04	1.65

TABLE XIV.—*Twenty posts giving the highest admission rates for malarial diseases, rheumatism and diarrheal and venereal diseases, etc.*—Continued.

II.—RHEUMATISM.

Name of station.	Mean strength.	Ratio per 1,000 of mean strength.			
		Admissions.	Discharges.	Deaths.	Constantly non-effective.
Rock Island Arsenal, Ill	66	272.73	.....	.....	3.19
Fort Huachuca, Ariz	253	205.53	.....	.....	4.08
Camp Eagle Pass, Tex	68	147.06	.....	.....	2.17
Fort McIntosh, Tex	119	142.86	.....	.....	1.86
Fort D. A. Russell, Wyo	463	129.59	.....	.....	5.20
Fort Sherman, Idaho	279	121.86	.....	.....	2.85
Fort Niagara, N. Y	201	119.40	.....	.....	8.47
Fort McHenry, Md	186	118.28	.....	.....	2.26
Fort Wingate, N. Mex	212	117.92	.....	.....	5.32
Watervliet Arsenal, N. Y	60	116.67	16.67	.....	6.28
Fort Thomas, Ky	483	95.24	4.14	.....	5.25
Fort Snelling, Minn	483	89.03	.....	.....	2.59
Jackson Barracks, La	145	82.76	.....	.....	1.71
Fort Crook, Nebr	497	82.49	2.01	.....	3.86
Fort Clark, Tex	371	80.86	2.70	.....	2.25
Fort Washakie, Wyo	126	79.37	.....	.....	2.47
Fort Robinson, Nebr	379	79.15	.....	.....	1.75
Boise Barracks, Idaho	116	77.59	.....	.....	5.32
Fort Myer, Va	284	77.47	3.52	.....	1.81
Fort Grant, Ariz	294	74.83	.....	.....	1.72
The Army	25,119	59.68	.99	.04	2.50

III.—DIARRHEAL DISEASES.

Fort Clark, Tex	371	301.89	.....	.....	1.74
Camp Eagle Pass, Tex	68	264.70	.....	.....	2.09
Fort Monroe, Va	531	227.87	.....	.....	2.23
Saint Francis Barracks, Fla	156	217.95	.....	.....	2.93
Fort Barrancas, Fla	134	186.57	.....	.....	2.37
Fort Huachuca, Ariz	253	181.82	.....	.....	.84
Washington Barracks, D. C	351	148.15	.....	.....	1.60
Fort McHenry, Md	186	134.41	.....	.....	1.08
Watervliet Arsenal, N. Y	60	133.33	.....	.....	2.19
Sandy Hook Proving Ground, N. J	65	123.08	.....	.....	.80
Fort Grant, Ariz	294	122.45	.....	.....	2.17
Fort D. A. Russell, Wyo	463	116.63	.....	.....	.79
Fort Slocum, N. Y	194	113.40	.....	.....	1.01
Fort Wingate, N. Mex	212	113.21	.....	.....	.99
Fort Logan, Colo	580	112.07	.....	.....	1.13
Fort Bliss, Tex	200	110.00	.....	.....	.75
Fort McIntosh, Tex	119	109.24	.....	.....	1.13
Fort Sill, Okla	406	105.91	.....	.....	.86
Fort Preble, Me	67	104.48	.....	.....	.78
Fort Sheridan, Ill	738	100.27	.....	.....	.75
The Army	25,119	80.02	.11	.....	.74

IV.—VENEREAL DISEASES.

Jefferson Barracks, Mo	345	211.59	.....	.....	14.53
Fort Ringgold, Tex	126	206.35	.....	.....	11.71
Fort Mason, Cal	73	191.78	.....	.....	11.75
Little Rock, Ark	64	187.50	.....	.....	10.33
Fort Leavenworth, Kans	758	184.70	.....	.....	13.07
Camp Eagle Pass, Tex	68	176.47	.....	.....	19.37
Columbus Barracks, Ohio	468	160.26	.....	.....	10.99
San Diego Barracks, Cal	64	156.25	.....	.....	9.99
Fort Thomas, Ky	483	155.28	.....	.....	11.82
Fort McIntosh, Tex	119	151.26	.....	.....	22.36
Fort Crook, Nebr	497	150.90	.....	.....	9.06
Fort Wayne, Mich	250	148.00	.....	.....	5.95
Washington Barracks, D. C	351	136.75	.....	.....	6.39
Alcatraz Island, Cal	134	126.87	.....	.....	11.19
Fort Logan, Cal	580	125.86	.....	.....	8.23
Fort Clark, Tex	371	121.30	.....	.....	8.99
Fort Riley, Kans	826	117.43	.....	.....	7.03
Jackson Barracks, La	145	117.24	.....	.....	7.88
Fort Brown, Tex	111	117.12	.....	.....	8.59
Fort Myer, Va	284	105.63	.....	.....	6.39
The Army	25,119	78.08	.....	.04	5.26

TABLE XV.—*Twenty posts giving the highest noneffective rates for malarial diseases, rheumatism, and diarrheal and venereal diseases, respectively, during 1896.*

I.—MALARIAL DISEASES.

Name of station.	Mean strength.	Constantly noneffective per 1,000 of mean strength.	Average number of sick daily.	Average number of days each case was treated.
Jefferson Barracks, Mo	345	16.05	5.54	16.47
Washington Barracks, D. C	351	9.82	3.45	3.35
Fort Myer, Va	284	5.83	1.66	3.31
Fort Monroe, Va	531	4.84	2.57	7.52
Willets Point, N. Y	409	4.46	1.82	5.80
Fort Sill, Okla	406	4.42	1.80	5.57
Fort Wadsworth, N. Y	201	4.25	.86	6.66
West Point, N. Y	381	3.94	1.50	4.55
Fort Slocum, N. Y	194	3.87	.75	4.74
Saint Francis Barracks, Fla	156	3.73	.58	11.83
Fort Niagara, N. Y	201	3.71	.75	10.50
Watervliet Arsenal, N. Y	60	3.37	.20	10.57
Fort Grant, Ariz	294	3.04	.89	10.22
Fort McPherson, Ga	532	2.78	1.48	36.07
Fort Hamilton, N. Y	268	2.67	.72	5.57
Fort McHenry, Md	186	2.57	.48	7.29
Fort Logan, Colo	580	2.26	1.31	21.82
Fort Brown, Tex	111	1.87	.21	7.60
Fort Thomas, Ky	483	1.71	.83	8.63
Fort Bliss, Tex	200	1.71	.34	17.86
The Army	25,119	1.65	41.52	7.28

II.—RHEUMATISM.

Fort Niagara, N. Y	201	8.47	1.70	25.96
Fort Brown, Tex	111	6.67	.74	33.88
Watervliet Arsenal, N. Y	60	6.28	.38	19.71
Boise Barracks, Idaho	116	5.32	.62	25.11
Fort Wingate, N. Mex	212	5.32	1.13	16.52
Fort Thomas, Ky	483	5.25	2.54	20.18
Fort D. A. Russell, Wyo	463	5.20	2.41	14.70
Alcatraz Island, Cal	134	4.28	.57	52.50
San Diego Barracks, Cal	64	4.27	.27	25.00
Fort Huachuca, Ariz	253	4.08	1.03	7.27
Fort Crook, Nebr	497	3.86	1.92	17.15
Washington Barracks, D. C	351	3.64	1.28	19.50
Columbus Barracks, Ohio	468	3.25	1.52	15.91
Rock Island Arsenal, Ill	66	3.19	.21	4.28
Fort Canby, Wash	94	3.08	.29	17.67
Fort Bliss, Tex	200	3.05	.61	22.30
Fort Adams, R. I	285	2.99	.85	22.29
Fort McPherson, Ga	532	2.85	1.51	18.47
Fort Sherman, Idaho	279	2.85	.80	8.56
Fort Ethan Allen, Vt	223	2.71	.60	13.81
The Army	25,119	2.50	62.71	15.31

III.—DIARRHEAL DISEASES.

Saint Francis Barracks, Fla	156	2.93	0.46	4.91
Fort Barrancas, Fla	134	2.37	.32	4.64
Fort Monroe, Va	531	2.23	1.19	3.59
Watervliet Arsenal, N. Y	60	2.19	.13	6.00
Fort Grant, Ariz	294	2.17	.64	6.50
Camp Eagle Pass, Tex	68	2.09	.15	2.89
Jefferson Barracks, Mo	345	1.89	.65	9.52
Fort Clark, Tex	371	1.74	.64	2.11
Washington Barracks, D. C	351	1.60	.56	3.96
Fort Thomas, Ky	483	1.54	.74	6.18
Fort Brown, Tex	111	1.23	.14	7.14
Fort Logan, Colo	580	1.13	.65	3.68
Fort McIntosh, Tex	119	1.13	.13	3.77
Fort McPherson, Ga	532	1.12	.60	4.19
Fort McHenry, Md	186	1.08	.20	2.92
Fort Slocum, N. Y	194	1.01	.20	3.27
Fort Wingate, N. Mex	212	.99	.21	3.21
Fort Columbus, N. Y	235	.96	.22	4.10
Key West Barracks, Fla	132	.93	.12	4.09
Fort Leavenworth, Kans	758	.92	.70	4.64
The Army	25,119	.74	18.64	3.39

TABLE XV.—*Twenty posts giving the highest noneffective rates for malarial diseases, rheumatism, and diarrheal and venereal diseases, respectively, etc.*—Continued.

IV.—VENEREAL DISEASES.

Name of station.	Mean strength.	Constantly noneffective per 1,000 of mean strength.	Average number of sick daily.	Average number of days each case was treated.
Fort McIntosh, Tex	119	22.36	2.66	54.11
Camp Eagle Pass, Tex	68	19.37	1.32	40.17
Jefferson Barracks, Mo	345	14.53	5.01	25.14
Fort Leavenworth, Kans	758	13.07	9.90	25.89
Fort Thomas, Ky	483	11.82	5.71	27.87
Fort Mason, Cal	73	11.75	.86	22.43
Fort Ringgold, Tex	126	11.71	1.48	20.77
Alcatraz Island, Cal	134	11.19	1.50	32.30
Columbus Barracks, Ohio	468	10.99	5.14	25.10
Little Rock, Ark	64	10.33	.66	20.17
San Diego Barracks, Cal	64	9.99	.64	23.40
Fort Crook, Nebr	497	9.06	4.50	21.97
Fort Clark, Tex	371	8.99	3.33	27.11
Fort Brown, Tex	111	8.59	.95	26.85
Fort Logan, Colo	580	8.23	4.78	23.95
Jackson Barracks, La	145	7.88	1.14	24.59
Fort Walla Walla, Wash	254	7.82	1.99	33.05
Fort Sheridan, Ill	738	7.81	5.76	31.95
Fort McHenry, Md	186	7.79	1.45	37.86
Fort Riley, Kans	826	7.03	5.81	21.91
The Army	25,119	5.26	132.24	24.68

TABLE XVI.—*Prevalence of alcoholism at the various posts, and its influence on the effective force of the garrisons, for the year 1896.*

Name of station.	Mean strength.	Ratio per 1,000 of mean strength.	
		Admissions.	Constantly non-effective.
Fort Warren, Mass	131	152.67	2.11
Camp Eagle Pass, Tex	68	102.94	.84
Fort Slocum, N. Y	194	92.78	.75
Fort Barrancas, Fla	134	89.55	.72
Fort D. A. Russell, Wyo	463	86.39	1.63
Key West Barracks, Fla	132	83.33	.33
San Diego Barracks, Cal	64	78.12	.90
Fort Brown, Tex	111	72.07	1.08
Fort Mason, Cal	73	68.50	.64
Plattsburg Barracks, N. Y	517	61.90	.78
Fort Snelling, Minn	483	60.04	.82
Fort Thomas, Ky	483	55.90	.99
Fort Sheridan, Ill	738	54.20	1.27
Fort Sherman, Idaho	279	53.76	.78
Columbia Arsenal, Tenn	19	52.63	.86
Fort Crook, Nebr	497	52.31	.87
Fort Schuyler, N. Y	117	51.28	.44
Madison Barracks, N. Y	476	50.42	.59
Vancouver Barracks, Wash	568	47.54	.43
Willets Point, N. Y	409	46.45	.52
Sandy Hook Proving Ground, N. J	65	46.16	.17
Rock Island Arsenal, Ill	66	45.45	.33
Fort Niobrara, Nebr	502	43.82	2.23
Fort Logan, Colo	580	43.10	.51
Fort Wadsworth, N. Y	201	39.81	1.39
Fort Wingate, N. Mex	212	37.74	.26
Fort Hamilton, N. Y	268	37.31	.78
Fort Spokane, Wash	167	35.93	.28
Presidio of San Francisco, Cal	559	35.78	.32
Fort McIntosh, Tex	119	33.61	.23
Whipple Barracks, Ariz	210	33.33	.27
Fort Adams, R. I	285	31.58	.37
Fort Douglas, Utah	508	31.40	.30
Little Rock, Ark	64	31.25	.13
Fort Grant, Ariz	294	30.61	.28
Columbus Barracks, Ohio	408	29.91	.44
Fort Preble, Me	67	29.85	.33
Fort Columbus, N. Y	235	29.79	.41
Fort Trumbull, Conn	68	29.41	.73
Fort Brady, Mich	256	27.34	.35
Springfield Armory, Mass	37	27.03	.15
Fort McPherson, Ga	532	26.32	.42
Fort Sam Houston, Tex	646	26.32	.38
Boise Barracks, Idaho	116	25.86	.16
St. Francis Barracks, Fla	156	25.64	.35
Watertown Arsenal, Mass	40	25.00	.27
Fort Bliss, Tex	200	25.00	.11
Fort Meade, S. Dak	456	24.12	.46
Fort Myer, Va	284	21.13	.10
Jackson Barracks, La	145	20.69	.19
Jefferson Barracks, Mo	345	20.29	.14
Washington Barracks, D. C	351	19.94	.18
Fort Niagara, N. Y	201	19.90	.42
Angel Island, Cal	256	19.53	.33
Fort Monroe, Va	531	18.83	.27
Fort Clark, Tex	371	16.17	.40
Fort McHenry, Md	186	16.13	.24
Fort Sill, Okla	406	14.78	.13
Fort Leavenworth, Kans	758	13.19	.41
Fort Canby, Wash	94	10.64	.03
Fort Keogh, Mont	286	10.49	.05
Benicia Barracks, Cal	209	9.57	.08
Fort Assinniboine, Mont	431	9.28	.10
Fort Yellowstone, Wyo	108	9.26	.08
Fort Ethan Allen, Vt	223	8.97	.06
Fort Custer, Mont	342	8.77	.05
Fort Porter, N. Y	115	8.70	1.78
Fort Riley, Kans	826	8.47	.11
Fort Wayne, Mich	250	8.00	1.15
Fort Washakie, Wyo	126	7.94	.07
West Point, N. Y	381	7.87	.06
Alcatraz Island, Cal	134	7.46	.10
Fort Missoula, Mont	272	7.35	.05
Fort Apache, Ariz	325	6.15	.15
Fort Reno, Okla	352	5.68	.05
Fort Yates, N. Dak	214	4.67	.04
Fort Huachuca, Ariz	253	3.95	.01
Fort Walla Walla, Wash	254	3.94	.04
Fort Bayard, N. Mex	354	2.82	.01
Hot Springs General Hospital, Ark	43	.....	.....
Allegheny Arsenal, Pa	32	.....	.....
Augusta Arsenal, Ga	29	.....	.....
Baltimore attending surgeon, Md	10	.....	.....
Boston attending surgeon, Mass	26	.....	.....
Chicago headquarters, Ill	25	.....	.....
Denver headquarters, Colo	16	.....	.....
Fort Du Chesne Utah	120	.....	.....
Frankford Arsenal, Pa	45	.....	.....
Fort Harrison, Mont	124	.....	.....
Indianapolis Arsenal, Ind	25	.....	.....
Kennebec Arsenal, Me	15	.....	.....
New York attending surgeon, N. Y	20	.....	.....
Omaha headquarters, Nebr	10	.....	.....
Philadelphia attending surgeon, Pa	11	.....	.....
Fort Ringgold, Tex	126	.....	.....
Fort Robinson, Nebr	379	.....	.....
St. Paul headquarters, Minn	30	.....	.....
San Antonio headquarters, Tex	15	.....	.....
San Carlos, Ariz	46	.....	.....
San Francisco headquarters, Cal	28	.....	.....
Watervliet Arsenal, N. Y	60	.....	.....
The Army	25,119	29.06	.49

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service and to the age, nativity, and length of service of individuals in average annual ratios per thousand of mean strength for the period 1890–1896, inclusive.*

Causes of admission to sick report.	Total.	Arms of service.							Ages (years).								
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	All others.	19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
SPECIAL.																		
Vaccinia:																		
Admissions—																		
Officers	1.42	2.33	0.47	2.13			1.10			3.85	5.35	1.23		0.79		0.70		
Enlisted	40.67	26.79	24.72	40.77	6.84	40.49	3.29	190.92	225.41	94.87	28.62	9.33	4.73	2.95	2.86	3.16		10.20
Noneffective—																		
Officers	.02	.03	.003	.02			.03			.06	.05	.03		.01		.01		
Enlisted	1.13	.68	.49	1.23	.10	.93	.06	6.10	6.10	2.64	.80	.23	.12	2.06	.05	.07		.28
Discharges—																		
Enlisted	.01			.04						.02								
Typhoid fever:																		
Admissions—																		
Officers	2.55	2.10	3.74	4.97		5.17				9.63	6.54	4.30	1.29	.79	.89			
Enlisted	5.74	5.74	8.03	4.74	5.28	.68	4.52	2.21	20.10	10.31	5.74	2.58	2.16	1.87	.68		1.81	
Noneffective—																		
Officers	.80	.49	1.36	1.82		1.52				1.79	2.45	1.44	.30	.31	.17			
Enlisted	.88	.84	1.24	.75	.96	.18	.54	.45	2.46	1.60	.85	.42	.37	.24	.05		.05	
Discharges—																		
Enlisted	.01	.01			.29						.02	.03						
Deaths—																		
Officers	.27	.50		.51						2.75	.42	.44						
Enlisted	.59	.54	.91	.58	.58		.38	.21	3.32	.95	.69	.23	.06	.27	.13		1.68	
Malarial infections:																		
Admissions—																		
Officers	40.20	38.44	58.49	61.79	10.45	13.79	38.50	3.05		57.80	63.02	47.91	30.32	28.35	45.46	27.24	30.27	22.33
Enlisted	81.74	46.28	110.79	163.24	60.91	130.66	55.31	64.35	164.40	124.98	78.61	57.15	46.48	46.86	44.10	35.97	30.74	51.02
Noneffective—																		
Officers	1.86	1.59	2.69	2.15	.22	.38	4.02	.14		1.32	3.02	1.94	1.70	1.43	2.09	1.79	1.07	.85
Enlisted	1.98	1.42	2.67	2.92	1.38	2.11	1.46	1.87	3.55	3.10	1.93	1.34	1.08	1.07	.85	.99	1.15	1.37
Discharges—																		
Enlisted	.06	.05	.05	.04			.19	.14	.66	.10	.04			.09		.37		
Deaths—																		
Officers	.13		.33			1.23					.42	.44						
Enlisted	.07	.10	.05	.08						.10	.05	.07	.06	.09				
Rheumatic fever:																		
Admissions—																		
Officers	4.44	4.43	3.74	7.10	6.97		3.30	5.08		1.93	2.97	2.46	1.29	6.30	7.13	8.38	4.04	7.44
Enlisted	4.80	4.80	4.70	4.29	3.73	6.12	7.81	4.79	8.61	5.71	4.11	4.06	4.26	5.01	5.58	7.11	9.04	
Noneffective—																		
Officers	.60	.59	.67	.88	.59		.11	.86		.90	.19	.22	.48	1.04	1.33	.59	.63	.32
Enlisted	.52	.52	.65	.49	.23	.42	.64	.56	.61	.67	.45	.42	.43	.59	.46	.62	.55	

Discharges—																		
Enlisted	.05	.04	.09	.08							.08	.04		.06	.09	.13		
Deaths—																		
Officers	.07		.51															1.77
Enlisted	.01			.04								.02						
Tuberculosis of the lungs:																		
Admissions—																		
Officers	1.98	1.63	1.87	3.55			4.40	1.02		5.78	2.97	3.07	1.94	1.57	1.78	.70		
Enlisted	2.96	3.24	3.11	2.86	1.86	3.74	1.23	1.83	5.03	3.44	3.09	2.69	2.70	1.87	2.45	.40	3.62	10.20
Noneffective—																		
Officers	1.30	1.27	1.36	1.72			2.33	.94		2.92	3.32	1.19	.59	1.16	.72	1.09		
Enlisted	.66	.71	.67	.74	.31	1.21	.09	.40	.68	.68	.68	.62	.67	.94	.39	.09	.61	1.84
Discharges—																		
Enlisted	1.65	1.68	1.71	2.15	.86	1.26	.95	.92	2.66	1.92	1.86	1.41	1.31	1.46	.50	.37	1.68	
Deaths—																		
Officers	.68	.66	1.00	1.01		1.23						1.31	.46	1.68	1.27	.50		
Enlisted	.51	.54	.35	.37	1.44	.94	.57	.78		.42	.49	.47	.56	.46	1.39		1.68	18.87
Syphilis:																		
Admissions—																		
Officers	.28	.47					1.10					1.23	.65					
Enlisted	14.98	14.74	14.70	20.70	4.04	14.97	4.52	14.07	22.25	22.09	16.88	11.21	8.17	5.61	2.59	2.37		
Noneffective—																		
Officers	.06	.05					.66					.01	.39					
Enlisted	1.60	1.58	1.65	2.10	.52	2.08	.43	1.35	2.22	2.31	1.73	1.26	1.18	.54	.37	.13		
Discharges—																		
Enlisted	1.29	1.13	1.19	1.24		.63	.76	3.17	2.66	2.06	1.38	.81	.63	.46	.25			
Deaths—																		
Officers	.07						.78						.46					
Enlisted	.03	.01	.05	.04			.19			.02	.04	.03	.06					
Gonorrhea:																		
Admissions—																		
Officers	1.98	2.33	3.28	2.84						21.19	2.97	2.46		.79				
Enlisted	45.22	44.31	46.16	56.32	7.77	24.16	7.61	56.52	128.50	89.57	42.34	21.15	10.20	4.22	3.67	1.58	1.81	
Noneffective—																		
Officers	.20	.20	.54	.08						2.15	.48	.12		.01				
Enlisted	2.62	2.55	2.61	3.41	.45	1.60	.33	3.28	8.18	5.19	2.46	1.16	.62	.25	.16	.06	.03	
Discharges—																		
Enlisted	.18	.16	.12	.37			.38	.21	.66	.38	.20	.03						
All venereal diseases:																		
Admissions—																		
Officers	3.59	4.43	5.61	4.26			1.10			26.98	8.32	4.30	.65	.79		.70		
Enlisted	80.42	80.04	80.96	97.00	17.09	51.04	19.54	97.44	193.82	145.28	81.32	45.75	24.59	12.97	8.85	4.74	1.81	10.20
Noneffective—																		
Officers	6.34	.28	.77	.11			.66			2.37	.86	.17	.39	.01		.04		
Enlisted	5.53	5.43	5.65	6.84	1.28	4.30	1.15	6.46	13.12	9.63	5.59	3.37	2.25	1.07	.68	.22	.03	.53
Discharges—																		
Enlisted	1.48	1.32	1.31	1.61		.63	1.14	3.38	3.32	2.46	1.58	.84	.69	.46	.25			
Deaths—																		
Officers	.07						.78						.46					
Enlisted	.03	.01	.05	.04			.19			.02	.04	.03	.06					

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.	Arms of service.							Ages (years).								
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	All others.	19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
SPECIAL—continued.																		
Alcoholism and direct results:																		
Admissions—																		
Officers	6.23	9.79	7.95	2.13	.....	.....	2.20	2.03	.....	1.93	2.97	8.60	12.26	9.45	6.24	4.19	1.01	2.48
Enlisted	36.31	45.30	19.72	46.27	27.97	106.50	16.86	10.95	2.87	9.17	22.35	42.45	62.29	104.05	102.91	135.57	103.07	91.84
Noneffective—																		
Officers	.15	.21	.12	.02	.....	.....	.41	.02	.....	.02	.02	.14	.41	.26	.08	.17	.01	.03
Enlisted	.45	.59	.23	.55	.34	1.20	.16	.12	.04	.09	.22	.48	.84	1.45	1.54	1.99	1.60	1.90
Discharges—																		
Enlisted	.03	.02	.02	.04	.....	.....	.19	.....	.....	.....	.02	.03	.06	.09	.13	.....	.....	.....
Deaths—																		
Officers	.13	.17	.33	.....	.....	.....	.....	.....	.....	.....	.42	.....	.....	.....	.....	.64	.....	.....
Enlisted	.23	.35	.12	.21	.....	.....	.19	.....	.....	.02	.05	.20	.25	.73	1.51	1.83	1.68	.....
Neuralgia:																		
Admissions—																		
Officers	24.54	34.02	23.86	20.60	.....	1.72	25.30	10.16	.....	13.49	19.62	20.27	23.87	31.50	29.41	29.33	17.15	44.66
Enlisted	20.23	19.96	22.98	20.92	29.21	22.12	8.43	14.15	22.25	22.60	18.46	18.03	19.79	21.61	20.96	28.46	27.12	20.41
Noneffective—																		
Officers	1.02	1.51	1.24	.33	.....	.15	.70	.44	.....	.09	.33	.77	.58	1.50	.81	2.18	1.62	1.18
Enlisted	.50	.53	.48	.55	.96	.51	.14	.33	.34	.40	.45	.46	.55	.67	.91	1.09	.75	.84
Discharges—																		
Enlisted	.13	.11	.07	.21	.58	.....	.....	.21	.....	.10	.13	.13	.06	.09	.25	.73	.....	.....
Tonsillitis:																		
Admissions—																		
Officers	20.29	27.26	20.12	21.31	17.42	3.45	17.60	2.03	.....	25.05	36.27	22.73	23.23	19.68	15.15	12.57	7.06	2.48
Enlisted	42.68	43.80	46.74	42.56	30.46	39.47	19.74	36.36	136.39	70.36	40.77	27.65	22.50	16.01	10.21	9.88	7.23	20.41
Noneffective—																		
Officers	.35	.45	.40	.36	.11	.05	.35	.07	.....	.34	.48	.42	.42	.29	.42	.31	.12	.02
Enlisted	.65	.68	.67	.62	.39	.66	.29	.66	1.97	1.09	.60	.41	.39	.26	.13	.14	.09	.53
Deaths—																		
Enlisted	.01	.....	.....	.....	.....	.....	.19	.07	.....	.02	.02	.....	.....	.....	.....	.....	.....	.....
Colic and constipation:																		
Admissions—																		
Officers	10.38	14.21	11.70	9.23	10.45	5.17	4.40	1.02	.....	21.19	14.86	9.83	9.03	10.24	8.91	9.08	6.05	4.96
Enlisted	32.29	31.67	37.27	35.23	25.48	64.65	12.54	17.57	72.51	43.76	31.12	26.23	22.76	22.70	19.87	21.74	21.70	.....
Noneffective—																		
Officers	.13	.23	.08	.06	.06	.01	.04	.02	.....	.11	.10	.17	.09	.07	.07	.32	.06	.05
Enlisted	.29	.30	.30	.28	.32	.68	.10	.16	.50	.35	.29	.24	.23	.24	.21	.24	.14	.....
Discharges—																		
Enlisted	.01	.01	.....	.....	.....	.32	.....	.....	.....	.....	.02	.....	.06	.....	.....	.....	.....	.....

Diarrheal diseases:																	
Admissions--																	
Officers	53.51	63.37	68.79	67.48	27.88	13.79	31.90	8.13	.....	67.44	62.42	43.00	43.23	66.14	53.48	61.46	41.37	42.18
Enlisted	103.01	96.84	113.29	133.35	123.06	159.24	34.96	63.82	202.43	134.95	98.70	82.00	79.44	80.96	75.68	84.58	72.33	142.86
Noneffective—																		
Officers	.87	.94	1.02	1.76	.27	.34	.26	.06	.....	.52	1.68	.56	.36	.92	.65	.75	1.47	.63
Enlisted	1.06	.95	1.27	1.31	1.66	1.28	.52	.67	1.77	1.25	.94	.93	1.00	1.09	1.02	1.30	1.21	4.92
Discharges—																		
Enlisted	.09	.06	.16	.04	.....	.....	.38	.....	.....	.06	.04	.07	.38	.18	.....	.....	.....	.....
Deaths—																		
Officers	.13	.33	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.72	1.77
Enlisted	.03	.05	.05	.....	.....	.....	.....	.....	.....	.....	.05	.....	.....	.....	.38	.....	.....	.....
Diseases of the heart:																		
Admissions—																		
Officers	4.06	5.36	3.28	4.26	3.48	1.72	3.30	2.03	.....	.....	.59	1.84	1.94	6.30	5.35	8.38	5.05	12.41
Enlisted	4.87	5.63	4.09	5.50	2.18	6.12	2.88	2.81	9.33	5.94	4.15	3.70	3.51	6.68	5.44	8.30	5.42	10.20
Noneffective—																		
Officers	1.22	1.84	1.11	1.60	.52	.01	.18	.15	.....	.....	.002	.95	.83	1.32	1.30	2.25	2.02	4.44
Enlisted	.45	.51	.37	.55	.22	.90	.22	.15	.42	.53	.30	.28	.36	.91	.78	.95	1.50	.14
Discharges—																		
Enlisted	1.24	1.40	1.19	1.70	.29	.94	.95	.35	1.33	1.39	.93	.77	1.00	2.37	1.89	4.39	3.35	.....
Deaths—																		
Officers	1.01	.66	1.67	.51	.....	1.23	.78	2.17	.....	.....	.42	.44	.....	.56	1.27	2.49	1.44	5.31
Enlisted	.29	.32	.28	.08	.58	.32	.38	.42	.....	.04	.11	.17	.44	1.00	1.64	2.20	1.68	.....
Coryza:																		
Admissions—																		
Officers	35.67	42.17	40.25	56.11	20.91	12.07	8.80	11.18	.....	65.51	32.11	25.80	38.71	45.67	31.19	36.31	32.29	27.30
Enlisted	28.09	26.34	20.48	33.79	59.97	46.95	6.79	47.23	73.22	39.41	24.77	22.79	21.21	23.09	17.83	13.04	12.66	.....
Noneffective—																		
Officers	.40	.46	.50	.53	.15	.10	.07	.27	.....	.58	.30	.28	.45	.38	.49	.44	.35	.57
Enlisted	.26	.26	.19	.29	.45	.42	.06	.48	.78	.36	.24	.20	.18	.26	.18	.17	.12	.....
Bronchitis:																		
Admissions—																		
Officers	71.82	89.94	74.40	109.38	34.84	1.72	35.20	19.31	.....	79.00	60.05	62.65	61.94	74.81	93.59	92.18	66.60	57.07
Enlisted	67.03	63.18	76.08	74.78	94.47	114.67	22.41	47.92	132.08	83.70	60.66	57.15	53.98	60.52	61.39	70.75	88.60	122.45
Noneffective—																		
Officers	2.15	2.03	3.14	2.84	2.95	.05	2.10	.65	.....	.95	.87	1.22	1.61	2.20	3.28	4.93	2.05	2.09
Enlisted	1.14	1.09	1.15	1.30	1.83	1.72	.53	1.08	2.63	1.38	.94	.88	1.12	1.32	1.25	1.63	2.60	4.92
Discharges—																		
Enlisted	.14	.18	.05	.21	.....	.....	.19	.07	.....	.06	.05	.07	.44	.27	.38	1.10	.....	.....
Deaths—																		
Enlisted	.02	.02	.....	.04	.....	.....	.....	.....	.....	.....	.....	.03	.....	.09	.13	.....	.....	.....
Pneumonia:																		
Admissions—																		
Officers	2.74	2.33	3.74	2.13	.....	1.72	5.50	2.03	.....	1.93	1.19	3.69	2.58	2.36	1.78	2.79	5.05	4.96
Enlisted	3.61	3.46	4.12	2.95	5.90	1.02	2.47	4.49	7.90	4.19	2.81	3.08	3.72	3.05	5.99	5.53	7.23	20.41
Noneffective—																		
Officers	.36	.22	.49	.26	.....	.06	1.49	.08	.....	.06	.16	.57	.50	.12	.17	.64	.49	.20
Enlisted	.35	.34	.37	.30	.99	.08	.16	.41	.66	.44	.27	.31	.40	.27	.48	.32	.36	4.53
Discharges—																		
Enlisted	.02	.04	.02	.....	.....	.....	.....	.....	.....	.04	.02	.....	.06	.....	.....	.....	.....	.....

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.	Arms of service.							Ages (years).								
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	All others.	19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
SPECIAL—continued.																		
Pneumonia—Cont'd.																		
Deaths—																		
Officers	.74	.83	1.33					1.45		1.37	.42	.44		1.12	.64	.50	2.16	1.77
Enlisted	.55	.52	.47	.21	.86	.32	.95	1.41	.66	.40	.38	.40	.69	1.00	1.01	3.66	3.35	9.43
Diseases of the kidneys:																		
Admissions—																		
Officers	4.72	4.66	3.74	8.52			3.30	7.11				3.69	2.58	6.30	6.24	11.17	8.07	2.48
Enlisted	1.36	1.36	1.49	.85	2.18	2.72	1.85	1.22	.72	1.01	.96	1.31	1.82	1.77	2.72	6.32	10.85	10.20
Noneffective—																		
Officers	1.12	1.03	.20	.84			1.34	4.71				.82	.06	3.20	.95	2.93	1.13	.05
Enlisted	.14	.15	.19	.08	.09	.43	.07	.08	.02	.14	.11	.11	.26	.15	.24	.24	.94	1.70
Discharges—																		
Enlisted	.16	.18	.21	.17						.20	.13	.13	.13	.09	.38			9.43
Deaths—																		
Officers	.81	.50	1.33	.51	2.49	1.23	.78	.72				.44	.46	.56	.64	1.99	2.88	
Enlisted	.22	.22	.19	.17	.58		.38	.35		.12	.13	.13	.44	.27	.88	.37	6.70	
Rheumatism and myalgia:																		
Admissions—																		
Officers	63.03	81.78	66.45	88.07	20.91	6.90	25.30	18.29		32.75	32.70	47.30	40.00	83.46	98.04	85.90	82.74	89.33
Enlisted	68.54	69.49	78.00	61.87	116.52	102.42	43.39	35.90	76.81	59.39	56.20	67.63	76.41	100.71	114.47	151.00	186.26	214.29
Noneffective—																		
Officers	4.69	5.32	5.16	8.52	1.58	.10	1.30	2.16		2.93	1.88	2.31	1.74	5.94	6.17	8.14	9.62	7.19
Enlisted	3.02	3.12	3.48	2.82	3.65	2.81	2.36	1.61	3.28	2.62	2.58	2.80	3.13	4.84	4.88	6.82	9.25	10.47
Discharges—																		
Enlisted	1.23	1.34	1.17	1.41	2.02	.94	.76	.49	1.33	.75	1.06	.91	.88	3.00	3.03	4.03	10.05	18.87
Deaths—																		
Officers	.13			.51			.78							.56				1.77
Enlisted	.01			.04							.02							
Boils and abscesses:																		
Admissions—																		
Officers	15.85	16.31	24.80	21.31	3.48	3.45	8.80	4.07		42.39	22.00	14.13	11.61	18.11	13.37	10.47	13.12	4.96
Enlisted	43.70	33.39	68.64	54.36	24.86	26.54	12.95	29.89	123.47	68.29	40.53	29.17	26.14	26.62	19.33	16.60	14.47	20.41
Noneffective—																		
Officers	.51	.46	1.06	.42	.03	.09	.26	.23		.65	.37	.78	.25	.32	.76	.50	.42	.85
Enlisted	.94	.80	1.33	1.02	.55	.58	.40	.68	2.24	1.32	.82	.72	.72	.73	.78	.67	.33	.50
Discharges—																		
Enlisted	.01	.02									.02			.09				
Deaths—																		
Officers	.07		.33									.44						

Conjunctivitis:																	
Admissions—																	
Officers	6.98	8.62	7.95	5.68	17.42	5.17	4.40			21.19	4.76	11.06	7.10	7.87	8.91	2.10	3.03	
Enlisted	11.30	11.41	14.19	9.65	10.56	18.71	1.64	6.85	15.79	14.95	10.69	9.98	8.58	8.65	6.94	7.90	7.23	20.41
Noneffective—																		
Officers	.43	.46	.16	.65	4.02	.03	.11			.62	.47	.75	.26	1.04	.12	.12	.14	
Enlisted	.27	.28	.33	.23	.19	.50	.04	.18	.34	.36	.26	.26	.19	.20	.21	.27	.06	1.17
Discharges—																		
Enlisted	.04	.04	.07					.07		.06	.02	.07			.13			
All diseases of the eye:																		
Admissions—																		
Officers	15.95	18.17	19.19	16.34	24.39	10.34	9.90	5.08		34.68	20.21	20.27	13.55	14.96	18.72	6.98	10.09	7.44
Enlisted	17.94	18.29	23.23	14.89	15.23	23.82	5.14	9.28	26.56	23.14	17.00	15.35	13.58	13.85	12.52	19.76	18.08	71.43
Noneffective—																		
Officers	1.71	1.39	1.31	2.89	8.48	.29	.99	1.83		1.47	1.52	2.95	1.05	1.91	1.09	1.16	2.16	2.38
Enlisted	.65	.72	.77	.46	.54	.74	.33	.33	.81	.75	.59	.60	.46	.55	.72	1.24	1.84	9.64
Discharges—																		
Enlisted	.94	1.11	.98	.66	1.15	.32	.76	.49	.66	.81	.86	1.01	.56	1.27	1.51	3.66	1.68	
All diseases of the ear:																		
Admissions—																		
Officers	4.25	3.73	5.15	7.10	6.97		5.50	1.02			4.16	4.30	7.10	4.72	6.24	3.49	1.01	2.48
Enlisted	7.23	7.56	7.04	7.64	6.21	7.48	4.11	6.54	30.87	10.33	6.29	5.08	5.54	5.31	4.35	5.14	7.23	10.20
Noneffective—																		
Officers	.31	.24	.42	.65	1.19		.05	.04			.11	.15	.39	.62	.07	.72	.02	.85
Enlisted	.31	.35	.29	.23	.22	.28	.26	.32	.85	.45	.28	.24	.24	.20	.12	.09	.21	1.37
Discharges—																		
Enlisted	.51	.60	.54	.37	.29		.57	.35		.57	.49	.47	.44	.46	.50	.73	1.68	9.43
Deaths—																		
Enlisted	.01	.01	.02							.02	.02							
Contusions and sprains:																		
Admissions—																		
Officers	39.92	45.44	59.43	42.62	17.42	17.24	19.80	8.13		75.14	65.99	42.39	29.03	38.59	31.19	29.33	29.26	9.93
Enlisted	140.40	114.18	214.75	156.54	86.70	163.32	25.50	90.96	248.39	191.94	144.37	110.44	94.51	83.61	77.31	71.54	79.57	61.22
Noneffective—																		
Officers	2.11	2.11	3.75	2.66	.57	.68	.76	.24		4.29	3.44	2.20	2.01	2.46	1.53	.93	1.33	.29
Enlisted	3.30	2.62	5.05	3.79	2.40	4.07	.62	2.18	4.39	4.03	3.19	2.97	2.64	2.74	2.80	2.71	2.71	2.10
Discharges—																		
Enlisted	.18	.16	.16	.29				.28		.24	.09	.23	.13	.18	.38			
Deaths—																		
Enlisted	.02	.02	.02							.02	.04							
Dislocations:																		
Admissions—																		
Officers	1.04	.23	3.28	.71		3.45					1.78	1.84		1.57	1.78		1.01	
Enlisted	2.74	2.38	3.89	3.08	1.55	4.08	1.44	1.22	1.44	3.83	2.91	2.32	1.55	1.57	.95	1.98		
Noneffective—																		
Officers	.06	.02	.15	.01		.34		.04			.08	.12		.02	.17		.09	.09
Enlisted	.19	.14	.34	.19	.06	.22	.04	.08	.12	.23	.20	.15	.15	.15	.14	.19		
Discharges—																		
Enlisted	.09	.02	.23	.12				.07		.10	.13	.10	.06					
Deaths—																		
Enlisted	.01		.02							.02								

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.	Arms of service.							Ages (years).								
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	All others.	19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
SPECIAL—continued.																		
Fractures, not gunshot:																		
Admissions—																		
Officers	5.28	5.59	7.95	.71	3.48	3.45	6.60	5.08	.....	3.85	5.35	3.07	6.45	4.72	4.46	5.59	9.08	4.96
Enlisted	7.30	5.85	11.77	7.73	5.28	4.42	2.47	4.41	12.20	8.00	7.65	6.10	5.94	6.68	6.67	9.09	9.04	20.41
Noneffective—																		
Officers	1.19	1.70	1.55	.10	.41	.41	.89	.67	.....	.31	.94	.46	1.53	1.05	1.10	1.04	2.41	1.17
Enlisted	1.23	.88	2.15	1.36	.95	.84	.23	.66	1.44	1.28	1.31	1.03	1.01	1.33	1.12	1.30	2.24	5.92
Discharges—																		
Enlisted	.49	.38	.87	.46	.58	.32	.....	.28	.66	.61	.46	.40	.38	.46	.38	.73	1.68	.....
Deaths—																		
Enlisted	.16	.13	.30	.12	.....	.....	.....	.07	.....	.16	.15	.10	.19	.18	.50	.....	.....	.....
Wounds, not gunshot:																		
Admissions—																		
Officers	7.46	10.48	9.36	5.68	6.97	1.72	2.20	1.02	.....	5.78	10.11	7.99	9.03	9.45	4.46	6.28	6.05	.....
Enlisted	55.60	52.11	71.72	67.72	40.40	65.66	9.87	24.95	99.78	74.33	55.96	46.59	40.87	34.29	28.58	28.86	41.59	61.22
Noneffective—																		
Officers	.29	.45	.27	.13	.67	.04	.03	.12	.....	.30	.26	.26	.13	.22	.56	.42	.33	.....
Enlisted	1.54	1.46	1.96	1.91	1.24	1.36	.37	.70	2.34	1.88	1.58	1.33	1.32	1.13	.95	.98	1.17	1.65
Discharges—																		
Enlisted	.24	.32	.16	.17	.....	.....	.....	.35	.66	.34	.31	.07	.25	.09	.....	.....	.....	.....
Deaths—																		
Enlisted	.05	.02	.09	.08	.....	.....	.....	.....	.....	.10	.02	.03	.....	.09	.....	.....	.....	.....
Wounds, gunshot:																		
Admissions—																		
Officers	.85	.70	.94	.71	6.97	.....	1.10	.....	.....	.....	1.19	1.23	1.94	.79	.89	.....	.....	.....
Enlisted	3.31	2.88	5.50	2.77	2.49	2.04	.82	1.44	8.61	5.32	3.22	2.39	1.35	1.67	.95	.40	.....	.....
Noneffective—																		
Officers	.39	.45	.38	.55	.10	.....	.67	.....	.....	.....	.08	.79	.59	.11	1.51	.....	.....	.....
Enlisted	.55	.48	1.05	.36	.11	.15	.09	.11	1.45	.88	.54	.29	.38	.27	.17	.33	.....	.....
Discharges—																		
Enlisted	.65	.65	1.08	.37	.29	.....	.19	.28	1.33	1.13	.60	.34	.44	.27	.25	.....	.....	.....
Deaths—																		
Officers	.54	.50	.67	.51	2.49	.....	.78	.....	.....	.....	1.27	.44	.....	1.12	.64	.....	.72	.....
Enlisted	1.11	.93	1.92	.83	1.73	.32	.38	.49	.....	.95	1.09	1.51	.94	1.18	1.39	.73	.....	.....
GROUPED.																		
Infectious diseases, general and local:																		
Admissions—																		
Officers	179.58	190.36	205.43	272.02	104.53	39.65	165.02	61.99	.....	235.07	241.98	182.44	167.10	170.08	199.65	149.43	122.08	106.70
Enlisted	329.55	272.77	358.82	436.87	234.31	345.02	182.42	457.82	878.67	540.29	303.91	210.75	171.11	165.25	145.09	116.21	113.93	255.10

Noneffective—																	
Officers	9.06	8.43	11.35	13.35	2.63	2.42	11.62	4.14	.....	13.02	14.42	8.29	7.51	7.55	9.29	8.07	5.48	7.08
Enlisted	13.24	12.02	13.71	15.81	7.66	11.26	6.19	18.85	33.16	21.97	12.51	8.25	6.62	6.14	4.75	3.78	4.10	10.67
Discharges—																		
Enlisted	3.42	3.26	3.46	3.98	1.44	1.89	2.29	4.51	7.31	4.81	3.62	2.49	2.13	2.37	.88	1.10	1.68	.....
Deaths—																		
Officers	2.09	1.66	3.00	2.53	.....	3.69	1.57	1.45	.....	2.75	1.70	2.19	2.30	2.81	1.91	.50	1.44	7.08
Enlisted	1.74	1.77	1.82	1.66	2.59	1.26	1.52	1.41	3.99	1.76	1.73	1.41	1.06	2.09	3.15	.73	3.35	28.30
Local infections (also entered under diseases of organs):																		
Admissions—																		
Officers	114.09	139.10	129.62	156.95	45.30	10.34	71.52	30.48	.....	156.07	131.39	111.18	98.70	114.97	130.13	106.84	92.83	89.33
Enlisted	165.40	150.87	205.74	183.19	165.63	186.46	62.10	131.27	410.62	238.12	154.17	124.81	110.78	106.20	100.86	110.27	119.35	183.67
Noneffective—																		
Officers	4.11	4.53	6.23	4.61	.88	.17	3.16	1.06	.....	2.86	3.88	5.40	3.25	3.24	4.94	3.47	4.27	6.98
Enlisted	3.75	3.51	4.45	4.00	4.04	3.60	1.56	3.40	9.12	5.09	3.42	2.95	2.86	2.75	2.98	2.82	2.91	10.81
Discharges—																		
Enlisted	.31	.26	.49	.37	.....	.63	.....	.14	1.33	.42	.40	.13	.19	.18	.....	.....	1.68	.....
Deaths—																		
Officers	1.08	1.50	1.33	.....	.....	.....	.....	2.17	.....	1.37	.42	.44	.....	1.12	1.27	1.00	4.32	1.77
Enlisted	.68	.65	.73	.25	1 15	.32	.95	1.34	1.33	.46	.56	.54	.69	1.18	1.39	3.66	1.68	9.43
Diseases of nutrition, general:																		
Admissions—																		
Officers	6.23	6.29	6.08	12.07	3.48	.....	4.40	4.07	.....	.....	1.19	1.23	2.58	4.72	8.02	18.16	13.12	9.93
Enlisted	1.63	1.91	1.14	1.48	.93	3.06	1.44	1.67	2.15	1.71	1.18	1.05	1.42	1.77	2.45	8.30	18.08	40.82
Noneffective—																		
Officers	1.32	1.61	1.26	1.97	.20	.....	.38	1.19	.....	.....	.36	.19	.08	.99	3.10	2.85	3.82	.71
Enlisted	.12	.16	.10	.10	.02	.11	.13	.07	.34	.08	.08	.09	.15	.15	.18	.99	1.53	10.34
Discharges—																		
Enlisted	.43	.45	.33	.58	.....	.....	.76	.42	.....	.10	.04	.27	.06	.64	2.02	7.69	13.40	66.04
Deaths—																		
Officers	.27	.17	.33	.....	.....	.....	.....	1.45	.....	.....	.....	.....	.....	.56	.64	.50	.72	.....
Enlisted	.04	.09	.....	.....	.....	.....	.....	.....	.....	.04	.....	.....	.19	.....	.13	.37	.....	.....
Diseases of the nervous system:																		
Admissions—																		
Officers	60.96	82.94	55.68	53.27	17.42	5.17	69.31	25.41	.....	40.46	47.57	65.11	67.74	74.02	72.20	64.95	39.35	67.00
Enlisted	80.13	87.10	65.28	96.51	86.70	162.63	46.68	48.98	73.95	61.64	62.64	78.73	102.41	146.00	144.95	185.79	166.36	163.26
Noneffective—																		
Officers	5.89	5.58	5.52	6.72	.30	1.24	12.28	5.25	.....	3.38	1.83	3.52	6.63	7.27	8.46	8.33	8.93	5.01
Enlisted	1 81	1.99	1.48	1.86	2.13	2.78	1.60	1.46	1.51	1.19	1.44	1.76	2.38	3.14	3.91	5.42	6.47	6.31
Discharges—																		
Enlisted	2.45	2.59	1.99	3.06	2.59	1.26	3.62	1.83	3.32	2.44	2.19	2.18	2.50	3.28	3.03	3.66	8.37	9.43
Deaths—																		
Officers	1.75	2.16	.67	1.52	7.46	2.46	.78	1.45	.....	.....	.85	.44	1.38	.56	2.54	4.48	3.60	1.77
Enlisted	.70	.79	.56	.54	1.44	.32	1.33	.56	.....	.24	.27	1.08	.94	1.64	2.65	2.93	1.68	9.43

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.	Arms of service.							Ages (years).								
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	All others.	19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
GROUPED—continued.																		
Diseases of the digestive system:																		
Admissions—																		
Officers	189.40	233.92	219.02	227.27	132.41	48.27	111.11	48.78	.....	210.02	222.96	176.29	150.98	196.06	213.92	208.11	146.30	173.71
Enlisted	266.20	257.80	294.81	292.70	294.90	436.54	114.14	194.71	618.81	364.32	253.12	206.47	193.48	192.17	175.31	185.79	160.94	204.08
Noneffective—																		
Officers	6.58	6.94	7.99	5.38	1.28	1.68	9.29	5.60	.....	2.95	5.29	6.93	3.57	6.58	8.80	8.68	7.23	11.53
Enlisted	3.70	3.60	4.15	3.89	4.39	5.02	1.87	2.81	7.56	4.64	3.30	2.99	3.29	3.63	3.35	3.81	2.50	6.03
Discharges—																		
Enlisted	.58	.48	.70	.83	.29	.63	.95	.35	1.33	.52	.44	.47	.94	1.00	.38	2.20	1.68	.....
Deaths—																		
Officers	1.21	1.16	.....	.51	4.98	2.46	2.35	2.17	.....	.....	.42	.....	.....	.....	2.54	1.49	3.60	8.85
Enlisted	.39	.46	.33	.08	1.15	.32	.38	.56	.66	.20	.35	.37	.44	.46	1.01	2.20	.....	18.87
Diseases of the circulatory system:																		
Admissions—																		
Officers	5.47	6.99	5.61	5.68	3.48	1.72	3.30	3.05	.....	1.93	1.19	3.07	2.58	6.30	8.02	9.78	9.08	14.89
Enlisted	6.03	6.98	4.95	6.53	4.35	8.17	3.70	3.73	11.49	6.59	5.11	5.01	4.19	9.13	8.17	13.04	9.04	20.41
Noneffective—																		
Officers	1.65	2.14	2.25	1.65	.52	.01	.18	.84	.....	.05	.01	1.00	.83	1.32	1.49	3.90	2.81	6.89
Enlisted	.55	.64	.46	.60	.50	1.09	.30	.20	.52	.57	.40	.41	.42	1.16	1.11	1.30	1.74	1.40
Discharges—																		
Enlisted	1.50	1.72	1.26	1.90	1.15	1.26	1.14	.49	1.99	1.55	1.11	1.21	1.25	2.73	2.14	5.49	3.35	.....
Deaths—																		
Officers	1.28	.83	1.67	.51	.....	1.23	2.35	2.90	.....	.....	.42	.44	.....	1.12	1.27	2.49	2.16	8.85
Enlisted	.37	.39	.37	.17	.58	.63	.38	.49	.....	.06	.13	.23	.50	1.46	2.14	2.20	1.68	.....
Diseases of the respiratory organs:																		
Admissions—																		
Officers	120.61	146.79	129.15	177.55	62.72	17.24	66.00	34.55	.....	150.30	106.42	101.35	113.55	132.29	141.71	143.17	112.00	91.82
Enlisted	105.45	100.02	109.14	117.92	172.16	161.96	35.16	101.54	223.27	134.53	93.27	89.25	85.72	96.48	94.05	101.18	130.20	173.47
Noneffective—																		
Officers	3.57	3.37	4.85	4.24	3.55	.26	5.21	1.07	.....	1.62	2.36	2.55	3.45	3.01	5.17	6.53	3.34	3.00
Enlisted	2.15	2.12	2.17	2.24	4.03	2.48	.84	2.10	4.51	2.61	1.76	1.72	2.02	2.48	2.51	2.75	4.03	12.12
Discharges—																		
Enlisted	.43	.44	.47	.50	.29	.94	.38	.07	.....	.40	.29	.40	.63	.73	.50	1.46	.....	9.43
Deaths—																		
Officers	.74	.83	1.33	.....	.....	.....	.....	1.45	.....	1.37	.42	.44	.....	1.12	.64	.50	2.16	1.77
Enlisted	.66	.59	.03	.37	.86	.32	1.14	1.55	.66	.46	.46	.50	.75	1.37	1.26	4.39	3.35	9.43

Diseases of the genito-urinary system:																	
Admissions—																	
Officers	13.49	16.54	16.38	14.91	3.48	.....	7.70	8.13	.....	7.71	16.05	11.67	9.68	10.24	10.69	16.85	17.15	22.33
Enlisted	9.69	9.99	10.08	8.94	10.25	11.23	6.99	8.59	15.08	12.94	8.73	7.66	7.23	6.68	9.39	13.04	18.08	30.61
Noneffective—																		
Officers	2.39	2.54	2.59	1.90	.24	.....	1.51	4.87	.....	.61	1.59	1.84	1.60	4.04	1.26	3.69	3.02	5.01
Enlisted	.64	.63	.79	.57	.43	.69	.33	.47	1.49	.75	.62	.45	.59	.50	.73	.76	1.21	2.65
Discharges—																		
Enlisted	.65	.57	.94	.83	.29	.....	.....	.42	3.99	1.05	.60	.30	.25	.18	.63	.37	.....	9.43
Deaths—																		
Officers	.87	.50	1.33	.51	2.49	1.23	1.57	.72	.....	.....	.....	.44	.46	.56	.64	1.99	3.60	.....
Enlisted	.22	.22	.19	.12	.58	.....	.38	.42	.....	.12	.13	.13	.44	.46	.63	.37	6.70	.....
Diseases of the lymphatic system and ductless glands:																		
Admissions—																		
Officers	.75	1.40	.....	.71	.....	.....	.....	1.02	.....	1.93	.59	2.46	.65	.....	.....	.....	1.01	.....
Enlisted	4.81	4.32	6.44	4.87	2.18	2.04	2.67	4.64	11.49	6.54	5.09	4.24	2.77	3.05	.68	1.19	1.81	.....
Noneffective—																		
Officers	.03	.06	.....	.05	.....	.....	.....	.03	.....	.28	.02	.08	.01	.....	.....	.....	.03	.....
Enlisted	.42	.38	.52	.45	.25	.18	.14	.47	.53	.57	.44	.40	.24	.25	.07	.03	.33	.....
Discharges—																		
Enlisted	.06	.04	.07	.12	.....	.....	.....	.07	.....	.08	.05	.07	.....	.09	.....	.....	.....	.....
Deaths—																		
Enlisted	.01	.01	.....	.....	.....	.....	.....	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....	.....
Diseases of the muscles, bones, and joints:																		
Admissions—																		
Officers	63.41	83.41	67.85	85.23	13.94	8.62	27.50	15.24	.....	32.75	35.67	48.53	45.16	82.68	97.15	81.70	82.74	81.89
Enlisted	74.82	75.60	86.22	69.33	120.26	107.86	42.36	38.94	109.83	68.20	61.47	73.44	80.93	105.22	115.96	154.15	186.26	224.49
Noneffective—																		
Officers	4.66	5.57	4.90	7.96	.99	1.34	1.52	1.40	.....	4.60	2.43	2.41	1.73	5.27	5.26	7.61	10.19	6.87
Enlisted	3.23	3.30	3.85	3.05	4.15	2.82	2.10	1.49	4.21	2.88	2.79	3.01	3.30	4.87	4.88	6.71	9.01	11.06
Discharges—																		
Enlisted	2.09	2.16	2.34	2.48	2.30	.94	.76	.99	3.99	1.76	2.08	1.55	1.38	3.73	3.40	4.76	10.05	18.87
Deaths—																		
Officers	.07	.....	.....	.....	.....	.....	.78	.....	.....	.....	.....	.....	.....	.56	.....	.....	.....	.....
Enlisted	.01	.01	.....	.....	.....	.....	.....	.....	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
Diseases of the integument and subcutaneous connective tissue:																		
Admissions—																		
Officers	28.21	31.22	41.18	36.22	6.97	8.62	15.40	5.08	.....	63.59	41.62	26.41	19.35	29.14	28.52	16.06	23.31	19.85
Enlisted	79.97	68.66	104.87	100.31	56.87	92.21	21.59	60.09	226.86	121.65	74.28	55.87	47.09	50.79	40.29	38.74	41.59	71.43
Noneffective—																		
Officers	1.17	1.26	1.84	1.19	.09	.46	.78	.32	.....	.85	1.10	1.41	.62	1.31	1.61	.62	1.64	1.95
Enlisted	1.99	1.85	2.42	2.44	1.20	2.02	.65	1.47	4.64	2.77	1.72	1.54	1.52	1.61	1.64	2.01	1.76	1.31
Discharges—																		
Enlisted	.15	.16	.16	.17	.....	.32	.....	.07	.....	.18	.13	.13	.19	.09	.13	.....	1.68	.....

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.	Arms of service.							Ages (years).								
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Medical Department.	All others.	19 and under.	20 to 24.	25 to 29.	30 to 34.	35 to 39.	40 to 44.	45 to 49.	50 to 54.	55 to 59.	60 and over.
GROUPED—continued.																		
Diseases of the integument and subcutaneous connective tissue—Continued.																		
Deaths—																		
Officers	.07	.....	.33	.....	.....	.....	.....	.....	.....	.....	.....	.44	.....	.....	.....	.....	.....	.....
Enlisted	.01	.....	.02	.....	.....	.....	.....	.....	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
Diseases of the organs of special sense																		
Admissions—																		
Officers	23.78	26.80	28.08	25.57	34.84	12.07	18.70	7.11	.....	38.54	29.13	27.64	24.52	25.20	27.63	11.17	15.13	14.89
Enlisted	26.95	27.95	31.74	23.69	23.31	36.41	10.90	16.96	63.18	35.97	25.04	21.66	20.00	20.63	17.83	26.09	28.93	31.64
Noneffective—																		
Officers	2.80	2.42	3.28	3.59	10.01	.32	1.82	2.56	.....	1.95	1.89	4.67	2.10	3.90	2.34	1.94	2.77	3.85
Enlisted	1.05	1.18	1.13	.73	.91	1.35	.67	.75	2.06	1.33	.95	.88	.73	.90	1.00	1.39	2.26	11.01
Discharges—																		
Enlisted	1.56	1.82	1.64	1.16	1.44	.32	1.33	.92	.66	1.55	1.42	1.61	1.00	1.82	2.14	4.39	3.35	9.43
Deaths—																		
Enlisted	.02	.01	.02	.....	.....	.....	.....	.07	.....	.04	.02	.....	.....	.....	.....	.....	.....	.....
Unclassified:																		
Admissions—																		
Officers	.19	.47	.....	.....	.....	.....	.....	.....	.....	1.93	.....	.....	.65	.....	.....	.....	.....	.....
Enlisted	3.03	3.21	3.08	2.46	.93	4.42	.82	3.80	10.05	5.26	2.79	1.56	2.09	.88	.82	.....	.....	.....
Noneffective—																		
Officers	.02	.04	.....	.....	.....	.....	.....	.....	.....	.29	.....	.....	.01	.....	.....	.....	.....	.....
Enlisted	.08	.08	.08	.06	.02	.07	.16	.08	.21	.15	.06	.03	.06	.05	.02	.....	.....	.....
Deaths—																		
Enlisted	.01	.....	.02	.....	.....	.....	.....	.....	.....	.....	.02	.....	.....	.....	.....	.....	.....	.....
General injuries:																		
Admissions—																		
Officers	3.02	3.50	4.21	4.97	.....	.....	1.10	.....	.....	.....	2.97	3.69	4.52	2.36	2.67	1.40	5.05	2.48
Enlisted	4.21	4.11	4.52	4.87	4.35	9.87	1.03	2.59	7.90	5.60	3.73	3.08	3.04	3.44	4.49	3.95	14.47	30.61
Noneffective—																		
Officers	.07	.09	.10	.07	.....	.....	.03	.....	.....	.....	.05	.25	.05	.02	.04	.01	.10	.01
Enlisted	.08	.07	.09	.12	.04	.25	.02	.03	.05	.09	.08	.06	.07	.11	.05	.06	.98	.61
Discharges—																		
Enlisted	.03	.04	.02	.04	.....	.....	.....	.....	.....	.02	.04	.....	.....	.18	.....	.....	.....	.....
Deaths—																		
Officers	.34	.50	.33	.....	.....	.....	.....	.72	.....	1.37	.42	.44	.....	.....	.....	.50	.72	.....
Enlisted	.98	1.01	.77	1.28	1.15	.94	.38	.49	2.66	1.09	.78	.77	1.00	1.00	.88	.73	3.35	.....

Injuries to special parts:																	
Admissions—																	
Officers	70.59	82.01	107.17	64.63	34.84	27.59	35.20	18.29	.....	113.68	101.66	74.94	54.84	67.72	59.72	62.85	59.53	22.33
Enlisted	266.44	233.83	383.02	289.40	175.89	303.50	57.16	155.93	485.30	357.67	269.16	214.54	189.02	174.39	151.76	148.22	184.45	173.47
Noneffective—																		
Officers	5.08	6.00	7.95	4.50	1.76	1.57	2.46	1.16	.....	5.53	5.95	5.41	4.91	4.86	5.87	3.62	5.93	1.78
Enlisted	8.57	7.33	12.95	9.18	6.08	8.32	2.07	4.51	12.28	10.42	8.64	7.22	6.82	7.08	6.76	7.02	8.28	9.97
Discharges—																		
Enlisted	3.06	3.01	4.23	2.82	1.44	.32	.95	1.97	5.32	4.12	2.90	2.42	2.13	2.46	2.14	2.20	6.70	.....
Deaths—																		
Officers	.87	1.00	1.33	.51	2.49	.....	.78	.....	.....	.....	2.12	.88	.46	1.12	.....	.50	.72	1.77
Enlisted	1.42	1.13	2.50	1.08	2.30	.94	.57	.56	.....	1.35	1.33	1.68	1.38	1.46	2.02	1.10	.....	.....
Total for diseases:																		
Admissions—																		
Officers	692.08	827.12	774.45	910.51	383.28	141.38	488.45	214.43	.....	784.20	744.35	646.19	604.52	730.71	807.49	721.37	581.23	602.98
Enlisted	988.25	916.27	1,076.56	1,163.61	1,007.15	1,371.55	468.85	941.51	2,244.79	1,359.63	896.65	755.64	718.43	798.00	755.01	843.48	875.22	1,265.31
Noneffective—																		
Officers	39.12	39.96	45.85	48.00	19.82	7.72	44.58	27.28	.....	29.61	31.32	32.88	28.14	41.25	46.76	52.22	49.27	51.91
Enlisted	28.98	27.96	30.87	31.81	25.69	29.88	14.99	30.23	60.73	39.52	26.06	21.53	21.32	24.87	24.16	28.96	34.93	72.91
Discharges—																		
Enlisted	13.32	13.67	13.36	15.61	9.79	7.56	11.24	10.15	22.61	14.42	11.96	10.69	10.32	16.65	15.26	31.11	43.55	122.64
Deaths—																		
Officers	8.35	7.31	8.67	5.57	14.92	11.07	9.41	11.60	.....	4.12	3.82	4.38	4.14	7.30	10.17	11.96	17.27	28.32
Enlisted	4.17	4.34	3.98	2.94	7.20	2.84	5.14	5.07	5.32	2.93	3.13	3.73	4.32	7.46	10.97	13.18	16.75	66.04
Total for injuries:																		
Admissions—																		
Officers	73.61	85.51	111.37	69.60	34.84	27.59	36.30	18.29	.....	113.68	104.63	78.62	59.35	70.08	62.39	64.25	64.58	24.81
Enlisted	270.65	237.94	387.54	294.26	180.24	313.37	58.19	158.51	493.19	363.28	272.90	217.62	192.06	177.84	156.25	152.17	198.92	204.08
Noneffective—																		
Officers	5.15	6.09	8.05	4.57	1.76	1.57	2.49	1.16	.....	5.53	6.00	5.66	4.96	4.88	5.91	3.63	6 03	1.79
Enlisted	8.65	7.40	13.05	9.30	6.12	8.57	2.09	4.54	12.33	10.51	8.71	7.28	6.89	7.19	6.81	7.07	9.26	10.59
Discharges—																		
Enlisted	3.09	3.05	4.26	2.86	1.44	.32	.95	1.97	5.32	4.14	2.93	2.42	2.13	2.64	2.14	2.20	6.70	.....
Deaths—																		
Officers	1.21	1.50	1.67	.51	2.49	.....	.78	.72	.....	1.37	2.54	1.31	.46	1.12	.....	1.00	1.44	1.77
Enlisted	2.35	2.15	3.27	2.36	3.45	1.89	.95	1.06	2.66	2.44	2.11	2.45	2.38	2.46	2.90	1.83	3.35	.....
Total for all causes:																		
Admissions—																		
Officers	765.69	912.63	885.82	980.11	418.12	168.97	524.75	232.72	.....	897.88	848.99	724.81	663.87	800.79	869.88	785.62	645.81	627.79
Enlisted	1,258.90	1,154.21	1,464.10	1,457.87	1,187.38	1,684.92	527.04	1,100.02	2,737.98	1,722.91	1,169.54	973.26	910.49	975.93	911.26	995.65	1,074.14	1,469.39
Noneffective—																		
Officers	44.27	46.05	53.90	52.57	21.58	9.29	47.07	28.44	.....	35.15	37.32	38.54	33.10	46.13	52.67	55.85	55.30	53.70
Enlisted	37.63	35.36	43.92	41.11	31.81	38.45	17.08	34.77	73.06	50.03	34.78	28.81	28.21	32.06	30.97	36.03	44.19	83.50
Discharges—																		
Enlisted	16.40	16.72	17.61	18.47	11.23	7.88	12.19	12.12	27.93	18.56	14.89	13.11	12.45	19.29	17.40	33.31	50.25	122.64
Deaths—																		
Officers	9.56	8.81	10.34	6.08	17.41	11.07	10.20	12.32	.....	5.49	6.36	5.69	4.60	8.42	10.17	12.96	18.71	30.09
Enlisted	6.52	6.49	7.25	5.30	10.65	4.73	6.09	6.13	7.98	5.37	5.24	6.18	6.70	9.92	13.87	15.01	20.10	66.04

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.	Nativities.											Length of service (years .	
		United States.	Ireland.	Germany.	England.	Canada.	Scandinavia.	Scotland.	Switzerland.	Austria.	Denmark.	France.	All others.	Under one.	One and over.
SPECIAL.															
Vaccinia:															
Admissions—															
Officers	1.42	1.49												12.05	1.25
Enlisted	40.67	52.60	23.05	9.39	21.05	38.32	31.71	23.02	17.19	23.60	23.38	13.31	17.31	211.00	7.96
Noneffective—															
Officers	.02	.02												.31	.01
Enlisted	1.13	1.51	.54	.16	.43	1.20	.70	.60	.40	.42	.56	.21	.35	5.63	.26
Discharges—															
Enlisted	.01	.01												.04	
Typhoid fever:															
Admissions—															
Officers	2.55	2.68												6.02	2.49
Enlisted	5.74	5.69	5.02	5.41	4.78	9.32	9.98	7.14	8.59	4.03	9.59	5.70	4.49	11.22	4.68
Noneffective—															
Officers	.80	.84												1.09	.79
Enlisted	.88	.88	.78	.81	.65	1.53	1.31	1.13	1.66	.53	1.44	.81	.62	1.68	.72
Discharges—															
Enlisted	.01	.02												.04	.01
Deaths—															
Officers	.27	.28													.27
Enlisted	.59	.60	.60	.51	.49	.96	1.09		.72		.56		.89	1.45	.43
Malarial infections:															
Admissions—															
Officers	40.20	38.89	51.29	42.10	54.54	37.04	90.91	62.50	76.92	250.00		40.00	264.71	6.02	40.74
Enlisted	81.74	84.24	81.94	74.67	77.50	85.95	75.16	75.40	87.50	57.00	68.95	77.94	70.85	137.84	70.97
Noneffective—															
Officers	1.86	1.88	1.49	.63	2.19	.30	2.49	1.80	2.11	2.05		.77	3.38	2.56	1.85
Enlisted	1.98	2.06	1.81	1.86	1.87	2.39	1.86	1.45	2.26	1.18	2.08	1.85	1.67	3.74	1.64
Discharges—															
Enlisted	.06	.04	.05	.15						.53				.11	.05
Deaths—															
Officers	.13	.14													.14
Enlisted	.07	.07	.05	.05								1.76	.30	.04	.07
Rheumatic fever:															
Admissions—															
Officers	4.44	4.27	10.26			37.04								6.02	4.41
Enlisted	4.80	4.92	4.59	4.25	3.54	6.90	7.34	3.17	7.03	2.88	7.19	1.90	2.89	7.73	4.24

Noneffective—															
Officers	.60	.61	.34			2.33								.13	.60
Enlisted	.52	.55	.47	.46	.45	.58	.66	.31	.36	.12	.90	.06	.34	.93	.44
Discharges—															
Enlisted	.05	.05	.05	.05			.27							.07	.05
Deaths—															
Officers	.07		3.66												.07
Enlisted	.01			.05											.01
Tuberculosis of the lungs:															
Admissions—															
Officers	1.98	2.08													2.01
Enlisted	2.96	3.33	2.97	1.49	1.42	3.45	3.82	4.76	3.13	1.73	1.80	5.70	.64	4.25	2.71
Noneffective															
Officers	1.30	1.32		5.59											1.32
Enlisted	.66	.68	.89	.46	.24	.58	1.03	.69	.87	.39	.41	2.09	.27	.76	.65
Discharges—															
Enlisted	1.65	1.84	1.70	.82	.33	2.56	2.18	4.41	1.45	.53	1.11	3.52	.30	2.20	1.54
Deaths—															
Officers	.68	.71													.68
Enlisted	.51	.55	.55	.26	.49	.64	1.09			1.07			.30	.60	.50
Syphilis:															
Admissions—															
Officers	.28	.30													.29
Enlisted	14.98	16.94	11.93	10.71	11.68	17.26	9.98	9.52	10.94	10.94	13.79	15.21	8.98	23.74	13.30
Noneffective—															
Officers	.06	.06													.06
Enlisted	1.60	1.89	1.06	1.05	1.18	2.28	.81	.82	1.22	1.06	1.20	.89	.68	2.38	1.45
Discharges—															
Enlisted	1.29	1.57	.80	.46	.82	2.56	1.09		.72	1.07			1.19	2.98	.96
Deaths—															
Officers	.07	.07													.07
Enlisted	.03	.03		.10											.03
Gonorrhea:															
Admissions—															
Officers	1.98	1.98		10.53										12.05	1.82
Enlisted	45.22	54.16	25.80	28.06	28.13	51.44	35.82	28.57	23.44	31.67	33.57	32.32	29.82	97.71	35.14
Noneffective—															
Officers	.20	.21		.12										.81	.19
Enlisted	2.62	3.16	1.46	1.56	1.48	2.77	2.26	1.84	1.71	1.53	2.35	1.50	1.68	5.62	2.04
Discharges—															
Enlisted	.18	.25	.10	.10										.53	.12
All venereal diseases:															
Admissions—															
Officers	3.59	3.67		10.53										12.05	3.45
Enlisted	80.42	93.98	50.96	53.14	57.50	91.82	63.71	57.94	47.66	60.45	68.35	72.24	52.90	156.52	65.81
Noneffective—															
Officers	.34	.36		.12										.81	.33
Enlisted	5.53	6.50	3.37	3.64	4.01	6.26	4.18	4.12	3.87	3.80	4.89	3.76	3.15	10.17	4.63
Discharges—															
Enlisted	1.48	1.84	.90	.56	.82	2.56	1.09		.72	1.07			1.19	3.55	1.08

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.[1]	Nativities.											Length of service (years).	
		United States.	Ireland.	Germany.	England.	Canada.	Scandinavia.	Scotland.	Switzerland.	Austria.	Denmark.	France.	All others.	Under one.	One and over.
SPECIAL—continued.															
All venereal diseases—Continued.															
Deaths—															
Officers	.07	.07													.07
Enlisted	.03	.03		.10											.03
Alcoholism and direct results:															
Admissions—															
Officers	6.23	6.25	10.26	10.53											6.33
Enlisted	36.31	28.51	90.96	26.62	51.84	47.98	24.66	46.83	23.44	19.00	12.59	49.43	23.09	17.19	39.99
Noneffective—															
Officers	.15	.14	.59	.14											.15
Enlisted	.45	.35	1.12	.34	.72	.48	.33	.58	.35	.16	.13	.60	.35	.17	.51
Discharges—															
Enlisted	.03	.03	.05		.16										.03
Deaths—															
Officers	.13	.14													.14
Enlisted	.23	.17	.45	.36		.32	.27	1.47			.56		.04		.27
Neuralgia:															
Admissions—															
Officers	24.54	23.71	25.64	73.68	36.36			62.50				40.00	117.64		24.93
Enlisted	20.23	20.14	21.16	20.88	21.41	15.88	19.38	12.70	19.53	17.85	15.59	30.42	22.44	25.54	19.22
Noneffective—															
Officers	1.02	.83	2.93	14.78	.60			.60				1.64	8.53		1.03
Enlisted	.50	.44	.59	.73	.36	.34	.46	1.33	.34	.29	.63	1.19	1.02	.50	.50
Discharges—															
Enlisted	.13	.10	.15	.20		.32							.89	.07	.14
Tonsillitis:															
Admissions—															
Officers	20.29	20.54	15.38	31.58	18.18	18.52								12.05	20.42
Enlisted	42.68	45.15	31.74	38.00	40.34	46.26	57.84	29.37	40.63	40.30	54.56	39.92	38.47	80.90	35.34
Noneffective—															
Officers	.35	.35	.85	.40	.20	.15								.05	.36
Enlisted	.65	.68	.54	.56	.59	.71	.92	.39	.55	.68	.87	.49	.65	1.28	.53
Deaths—															
Enlisted	.01	.01	.05											.04	.01

Colic and constipation:															
Admissions—															
Officers	10.38	10.61	10.26									40.00		6.02	10.45
Enlisted	32.29	34.72	30.01	24.80	27.07	32.80	28.19	23.81	31.25	28.79	31.78	17.11	30.46	51.00	28.70
Noneffective—															
Officers	.13	.13	.03									.33		.07	.13
Enlisted	.29	.31	.25	.26	.22	.30	.22	.20	.33	.21	.34	.15	.24	.43	.26
Discharges—															
Enlisted	.01	.02													.01
Diarrheal diseases:															
Admissions—															
Officers	53.51	52.58	46.16	63.15	163.63	18.52	90.91	93.75	230.77			120.00	58.82	6.02	54.26
Enlisted	103.01	106.21	111.79	82.74	111.29	108.39	96.60	97.62	80.47	69.66	92.93	138.78	78.23	163.61	91.38
Noneffective—															
Officers	.87	.86	.69	1.64	1.84	.25	1.24	3.59	1.90			1.53	.32	.03	.89
Enlisted	1.06	1.06	1.15	1.06	1.23	1.13	.91	1.07	.78	.66	1.34	1.44	.63	1.63	.95
Discharges—															
Enlisted	.09	.10	.05	.05			.27		.72					.14	.07
Deaths—															
Officers	.13	.07			12.82										.14
Enlisted	.03	.04		.05	.16										.04
Diseases of the heart:															
Admissions—															
Officers	4.06	3.87	10.26	10.53									29.41		4.12
Enlisted	4.87	4.71	5.34	5.19	5.13	5.87	3.52	5.56	3.91	6.33	4.80	7.60	4.49	7.50	4.36
Noneffective—															
Officers	1.22	1.00	8.06	4.35									24.88		1.24
Enlisted	.45	.38	.48	.68	.42	.80	.40	.68	.21	.65	1.05	.54	.31	.68	.40
Discharges—															
Enlisted	1.24	1.10	1.45	1.59	1.31	1.92	1.36	2.21	.72	2.13	1.67	1.76	.89	1.70	1.15
Deaths—															
Officers	1.01	.99		7.52											1.03
Enlisted	.29	.26	.50	.41		.32				.53	.56	1.76		.07	.33
Coryza:															
Admissions—															
Officers	35.67	36.01	10.26	21.05	72.73	18.52						80.00	117.64	18.07	35.95
Enlisted	28.09	29.15	28.83	21.82	29.19	35.55	24.08	22.22	21.87	31.06	22.18	24.71	26.93	51.08	23.68
Noneffective—															
Officers	.40	.40	.73	.14	.35	.05						.77	.73	.12	.40
Enlisted	.26	.28	.26	.21	.27	.28	.24	.19	.20	.27	.27	.19	.27	.51	.22
Bronchitis:															
Admissions—															
Officers	71.82	70.14	107.71	115.77	109.09	18.52	181.82	125.00				80.00	205.90	36.15	72.38
Enlisted	67.03	70.52	69.20	53.14	67.76	69.38	50.50	71.43	59.38	46.06	45.57	74.14	56.43	98.28	61.03
Noneffective—															
Officers	2.15	1.92	8.73	12.51	1.49	.25	5.48	2.99				3.61	8.53	.96	2.17
Enlisted	1.14	1.19	1.23	.84	1.14	1.20	1.12	2.49	1.05	.70	.65	1.08	1.01	1.69	1.04
Discharges—															
Enlisted	.14	.12	.20	.15	.33	.32	.27							.07	.15
Deaths—															
Enlisted	.02	.01	.10												.02

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.	Nativities.											Length of service (years).	
		United States.	Ireland.	Germany.	England.	Canada.	Scandinavia.	Scotland.	Switzerland.	Austria.	Denmark.	France.	All others.	Under one.	One and over.
SPECIAL—continued.															
Pneumonia:															
Admissions—															
Officers	2.74	2.78				18.52									2.78
Enlisted	3.61	3.90	3.08	3.15	3.01	5.18	2.64	4.76	4.69	.58	1.80		2.89	5.63	3.21
Noneffective—															
Officers	.36	.36				4.46									.37
Enlisted	.35	.40	.28	.26	.22	.56	.22	.53	.31	.08	.13		.24	.60	.30
Discharges—															
Enlisted	.02	.04												.04	.02
Deaths—															
Officers	.74	.78													.75
Enlisted	.55	.49	.80	.61	.98	.32	.82	.74			.56		.59	.71	.52
Diseases of the kidneys:															
Admissions—															
Officers	4.72	4.86		10.53											4.79
Enlisted	1.36	1.25	1.51	1.44	1.06	3.11	1.76	.79	.78	1.73	1.80	1.90	2.24	1.42	1.35
Noneffective—															
Officers	1.12	1.18		.20											1.14
Enlisted	.14	.14	.14	.12	.07	.52	.16	.02	.04	.08	.23	.12	.41	.19	.14
Discharges—															
Enlisted	.16	.16		.15		.32	.27		.72	.53			.89	.35	.12
Deaths—															
Officers	.81	.78				13.33									.82
Enlisted	.22	.20	.45	.10	.16	.32	.54				.56		.30	.14	.24
Rheumatism and myalgia:															
Admissions—															
Officers	63.03	61.41	138.46	21.05	72.73	129.63		62.50	76.92			40.00	147.06	12.05	63.85
Enlisted	68.54	68.75	76.54	67.99	55.20	70.76	59.89	53.97	66.41	62.75	50.96	72.24	67.65	71.56	67.97
Noneffective—															
Officers	4.69	4.52	12.48	.78	15.89	8.57		1.63	.84			.99	2.50	.31	4.76
Enlisted	3.02	3.07	3.41	3.00	2.27	3.56	2.68	1.69	3.28	2.57	2.44	1.96	1.77	3.26	2.96
Discharges—															
Enlisted	1.23	1.13	1.60	1.38	1.15	2.24	1.09		.72	3.20	1.67		.30	1.06	1.26
Deaths—															
Officers	.13	.07	3.66												.14
Enlisted	.01			.05											.01

Boils and abscesses:															
Admissions—															
Officers	15.85	15.97	10.26	10.53									117.64	6.02	16.01
Enlisted	43.70	47.06	33.25	41.32	39.98	44.87	30.24	39.68	53.91	39.73	31.78	39.92	34.95	81.48	36.45
Noneffective—															
Officers	.51	.49	1.70	.17									3.46	.10	.51
Enlisted	.94	.98	.82	.96	.88	.78	.62	1.05	1.04	.88	.48	1.04	.93	1.60	.81
Discharges—															
Enlisted	.01	.01		.05										.04	.01
Deaths—															
Officers	.07	.07													.07
Conjunctivitis:															
Admissions—															
Officers	6.98	7.04			36.36							40.00			7.10
Enlisted	11.30	12.44	10.09	8.34	9.55	9.32	9.10	12.70	7.03	8.64	10.19	9.51	8.66	15.31	10.53
Noneffective—															
Officers	.43	.44			1.54							.88			.43
Enlisted	.27	.31	.27	.15	.15	.25	.17	.41	.07	.24	.20	.16	.49	.36	.26
Discharges—															
Enlisted	.04	.04	.05			.32								.07	.03
All diseases of the eye:															
Admissions—															
Officers	15.95	15.77	5.13	31.58	72.73							40.00	29.41		16.20
Enlisted	17.94	19.48	15.76	14.25	13.80	14.84	16.44	17.46	13.28	16.12	14.99	20.91	17.31	22.97	16.97
Noneffective—															
Officers	1.71	1.70	.31	7.90	2.89							.88	.56		1.74
Enlisted	.65	.67	.59	.61	.33	.69	.67	.81	.61	.49	.65	.82	1.16	.70	.64
Discharges—															
Enlisted	.94	.87	.85	1.23	1.15	1.92	.82	1.47	.72	1.07	1.11		.89	1.03	.93
All diseases of the ear:															
Admissions—															
Officers	4.25	4.07	10.26				90.91					40.00			4.31
Enlisted	7.23	6.79	7.23	7.29	7.78	7.59	12.33	8.73	16.41	6.91	11.99	9.51	7.37	13.63	6.00
Noneffective—															
Officers	.31	.26	3.31				1.49					.44			.32
Enlisted	.31	.30	.23	.25	.50	.18	.48	.18	.61	.40	.62	2.15	.51	.63	.25
Discharges—															
Enlisted	.51	.52	.40	.26	.82		.54		.72	1.07	1.11	1.76	1.78	1.06	.41
Deaths—															
Enlisted	.01	.02												.04	.01
Contusions and sprains:															
Admissions—															
Officers	39.92	39.68	35.90	52.63	36.36	37.04		31.25					176.47	12.05	40.36
Enlisted	140.40	145.38	148.72	115.17	124.92	158.44	135.35	138.89	141.41	115.72	114.51	165.39	111.89	224.63	124.24
Noneffective—															
Officers	2.11	2.10	1.32	5.97	.60	.61		1.45					3.70	.28	2.13
Enlisted	3.30	3.27	3.94	3.05	3.04	3.35	3.50	3.95	3.28	2.52	2.79	3.77	2.59	5.02	2.97
Discharges—															
Enlisted	.18	.17	.30	.20								1.76	.30	.28	.16
Deaths—															
Enlisted	.02	.01		.05			.27								.02

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.	Nativities.											Length of service (years).	
		United States.	Ireland.	Germany.	England.	Canada.	Scandinavia.	Scotland.	Switzerland.	Austria.	Denmark.	France.	All others.	Under one.	One and over.
SPECIAL—continued.															
Dislocations:															
Admissions—															
Officers	1.04	1.09													1.05
Enlisted	2.74	2.88	2.59	2.60	3.01	2.42	1.47	.79		3.45	1.20	3.80	3.21	3.87	2.52
Noneffective—															
Officers	.06	.07													.06
Enlisted	.19	.20	.22	.13	.14	.15	.19	.02		.27	.09	.05	.18	.28	.17
Discharges—															
Enlisted	.09	.11	.15		.16									.14	.08
Deaths—															
Enlisted	.01	.01												.04	
Fractures, not gunshot:															
Admissions—															
Officers	5.28	4.66	15.38		54.54		90.91	31.25					29.41		5.37
Enlisted	7.30	7.35	8.10	6.74	8.14	8.28	6.46	7.94	5.47	6.33	3.60	3.80	6.09	9.72	6.83
Noneffective—															
Officers	1.19	1.04	2.24		8.36		16.92	21.90					8.05		1.20
Enlisted	1.23	1.18	1.52	1.16	1.23	1.31	1.18	1.90	.95	1.64	1.09	.60	1.21	1.37	1.20
Discharges—															
Enlisted	.49	.44	.65	.56	.49	.96	.54	.74		.53	.56		.59	.57	.48
Deaths—															
Enlisted	.16	.20	.15	.10				.74						.14	.16
Wounds, not gunshot:															
Admissions—															
Officers	7.46	7.24	5.13	10.53	54.54					250.00					7.57
Enlisted	55.60	56.99	60.83	47.45	50.07	54.88	54.32	52.38	46.88	59.30	45.57	57.03	45.85	76.96	51.50
Noneffective—															
Officers	.29	.27	.04	.58	3.78					9.58					.29
Enlisted	1.54	1.58	1.78	1.42	1.32	1.30	1.33	1.42	1.30	1.18	1.19	1.41	1.24	2.05	1.45
Discharges—															
Enlisted	.24	.28	.20	.20	.16					.53			.30	.50	.19
Deaths—															
Enlisted	.05	.04	.10		.16										.05
Wounds, gunshot:															
Admissions—															
Officers	.85	.89													.86
Enlisted	3.31	2.76	2.11	2.65	2.80	5.18	3.52	3.97	1.56	1.73	1.20	1.90	1.60	6.05	2.78

Noneffective—															
Officers	.39	.41													.40
Enlisted	.55	.59	.38	.46	.53	.97	.82	.85	.25	.35	.33	.25	.44	1.00	.46
Discharges—															
Enlisted	.65	.67	.55	.61	.33	1.28	1.36	.74		.53	.56		.59	1.14	.56
Deaths—															
Officers	.54	.50					66.67								.55
Enlisted	1.11	1.14	.95	1.28	.66	1.28	1.36	2.21	.72	1.07		1.76	.59	.96	1.14
GROUPED.															
Infectious diseases, general and local:															
Admissions—															
Officers	179.58	177.40	179.50	221.03	181.82	222.22	363.64	218.75	230.77	750.00		160.00	470.59	108.43	180.71
Enlisted	329.55	367.41	271.96	237.95	265.39	336.21	290.39	257.94	268.76	240.65	271.59	309.89	232.77	725.99	253.41
Noneffective—															
Officers	9.06	9.12	7.13	9.91	6.02	7.20	15.93	8.81	6.53	15.74		6.90	7.89	6.40	9.10
Enlisted	13.24	14.99	10.12	9.21	9.74	14.93	12.12	9.74	11.74	7.70	12.31	11.05	8.46	27.75	10.45
Discharges—															
Enlisted	3.42	3.98	2.80	1.69	1.31	5.44	3.81	4.41	2.17	2.13	1.11	3.52	1.78	6.21	2.88
Deaths—															
Officers	2.09	2.12	3.66												2.12
Enlisted	1.74	1.75	2.00	1.43	1.80	1.60	2.72		1.45	1.07	1.11	3.52	1.78	2.55	1.58
Local infections (also entered under diseases of organs):															
Admissions—															
Officers	114.09	113.20	117.95	157.89	145.45	55.56	181.82	125.00				120.00	294.12	54.22	115.04
Enlisted	165.40	174.98	145.15	145.38	156.93	175.01	149.15	158.73	166.41	138.17	148.07	163.50	134.98	282.64	142.92
Noneffective—															
Officers	4.11	4.00	5.62	4.61	17.92	4.87	5.48	4.79				3.72	4.51	1.10	4.15
Enlisted	3.75	3.92	3.49	3.27	3.37	4.21	3.22	4.97	4.02	3.22	3.65	3.23	3.10	6.35	3.25
Discharges—															
Enlisted	.31	.30	.30	.26	.66	1.28		.74	.72					.60	.26
Deaths—															
Officers	1.08	1.13													1.09
Enlisted	.68	.64	1.05	.67	.82	.32	.82	.74			.56		.59	.74	.67
Diseases of nutrition, general:															
Admissions—															
Officers	6.23	6.15		21.05		18.52						40.00			6.33
Enlisted	1.63	1.54	1.89	1.60	1.95	1.73	2.64	1.59	2.34	1.15	1.20	1.90	1.60	2.49	1.46
Noneffective—															
Officers	1.32	1.11		3.46		.71						97.24			1.34
Enlisted	.12	.11	.10	.19	.14	.03	.29	.04	.22	.38	.08	.01	.08	.14	.12
Discharges—															
Enlisted	.43	.22	.90	.82	.66		.27	.74	1.45	1.07	1.67		.89	.11	.49
Deaths—															
Officers	.27	.28													.27
Enlisted	.04	.05		.05											.05

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.	Nativities.											Length of service (years).	
		United States.	Ireland.	Germany.	England.	Canada.	Scandinavia.	Scotland.	Switzerland.	Austria.	Denmark.	France.	All others.	Under one.	One and over.
GROUPED—continued.															
Diseases of the nervous system:															
Admissions—															
Officers	60.96	58.63	76.93	147.35	90.91	55.56	.....	62.50	307.69	.....	.....	120.00	264.71	.....	61.93
Enlisted	80.13	72.84	135.88	68.60	94.83	85.26	64.30	74.61	67.19	63.38	50.36	117.87	70.85	83.05	79.56
Noneffective—															
Officers	5.89	5.24	6.64	37.20	.85	26.97	.....	.60	2.95	.....	.....	79.17	35.83	.....	5.98
Enlisted	1.81	1.58	2.79	1.96	1.90	1.64	1.75	2.32	1.77	1.81	1.35	3.81	2.61	1.89	1.80
Discharges—															
Enlisted	2.45	2.09	3.40	2.81	3.28	3.52	2.72	.74	.72	3.73	3.33	1.76	4.16	3.55	2.24
Deaths—															
Officers	1.75	1.84	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.78
Enlisted	.70	.63	1.00	.67	.66	.96	.54	.74	1.45	1.07	1.11	1.76	.59	.35	.77
Diseases of the digestive system:															
Admissions—															
Officers	189.40	189.29	164.11	147.35	345.45	111.11	181.82	156.25	461.54	.....	.....	200.00	294.12	48.20	191.64
Enlisted	266.20	277.83	253.82	224.59	259.20	279.60	270.11	234.13	253.13	219.92	263.19	302.28	230.21	433.63	234.05
Noneffective—															
Officers	6.58	6.59	6.01	3.23	7.32	8.26	1.74	21.82	4.00	.....	.....	1.97	5.23	.64	6.67
Enlisted	3.70	3.75	3.59	3.67	3.36	4.30	3.65	3.03	3.90	2.74	3.70	4.75	3.37	5.67	3.32
Discharges—															
Enlisted	.58	.54	.60	.77	.16	.32	.54	1.47	2.90	.....	.....	1.76	.89	.82	.54
Deaths—															
Officers	1.21	1.06	7.33	.....	12.82	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.23
Enlisted	.39	.33	.30	.82	.49	.32	.27	.....	.....	.....	1.67	.....	.59	.28	.42
Diseases of the circulatory system:															
Admissions—															
Officers	5.47	5.06	10.26	21.05	18.18	.....	.....	31.25	.....	.....	.....	.....	29.41	.....	5.56
Enlisted	6.03	5.66	7.34	6.74	6.37	7.59	4.11	7.14	3.91	8.64	5.40	7.60	5.45	8.42	5.57
Noneffective:															
Officers	1.65	1.33	3.06	14.75	5.08	.....	.....	.17	.....	.....	.....	.....	24.88	.....	1.67
Enlisted	.55	.48	.65	.88	.52	.88	.43	.79	.21	.77	1.07	.54	.42	.72	.52
Discharges—															
Enlisted	1.50	1.32	1.80	1.94	1.64	2.24	1.63	2.21	.72	2.67	1.67	1.76	1.19	1.88	1.42
Deaths—															
Officers	1.28	1.27	.....	7.52	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.30
Enlisted	.97	.84	.70	.41	.16	.32	.....	.....	.....	.53	56	1.76	....	.18	.41

Diseases of the respiratory organs:															
Admissions—															
Officers	120.61	118.94	128.21	178.93	200.00	92.60	181.82	125.00				160.00	323.53	60.24	121.56
Enlisted	105.45	110.59	107.92	84.45	107.75	118.05	79.56	104.76	89.85	84.63	73.14	102.65	89.77	163.33	94.34
Noneffective—															
Officers	3.57	3.26	10.85	19.68	2.19	5.07	5.48	2.99				4.38	9.26	1.12	3.60
Enlisted	2.15	2.26	2.28	1.72	1.84	2.53	1.53	3.53	1.78	1.66	1.26	1.93	1.69	3.30	1.93
Discharges—															
Enlisted	.43	.40	.35	.82	.33	.96	.27	.74						.53	.41
Deaths—															
Officers	.74	.78													.75
Enlisted	.66	.60	1.00	.67	.98	.64	1.09	.74			.56		.59	.82	.63
Diseases of the genito-urinary system:															
Admissions—															
Officers	13.49	13.29	10.26	31.58	36.36	18.52						40.00			13.71
Enlisted	9.69	10.34	7.56	9.11	6.55	13.12	7.63	6.35	9.37	7.48	11.39	9.51	10.58	16.39	8.41
Noneffective—															
Officers	2.39	2.36	1.42	2.42	16.62	.71						4.38			2.43
Enlisted	.64	.64	.50	.63	.56	1.57	.50	.44	.65	.45	.66	.42	.89	.98	.57
Discharges—															
Enlisted	.65	.66	.55	.56	.49	1.60	.54		1.45	.53	1.11		.89	1.56	.48
Deaths—															
Officers	.87	.85				13.33									.89
Enlisted	.22	.20	.45	.10	.16	.32	.54				.56		.30	.14	.24
Diseases of the lymphatic system and ductless glands:															
Admissions—															
Officers	.75	.79													.77
Enlisted	4.81	5.06	4.43	4.03	4.42	5.52	5.58	4.76	4.69	4.03	5.40	3.80	2.56	7.16	4.35
Noneffective—															
Officers	.03	.03													.03
Enlisted	.42	.42	.46	.29	.43	.48	.61	.31	.66	.42	.92	.28	.34	.61	.38
Discharges—															
Enlisted	.06	.05	.10		.16								.30	.14	.04
Deaths—															
Enlisted	.01	.01													.01
Diseases of the muscles, bones, and joints:															
Admissions—															
Officers	63.41	62.10	128.21	31.58	72.73	92.60		62.50	76.92			40.00	147.06	6.02	64.33
Enlisted	74.82	75.29	82.10	74.73	59.62	76.63	62.24	61.11	70.31	71.39	54.56	79.85	75.98	81.17	73.62
Noneffective—															
Officers	4.66	4.52	12.14	.83	15.88	6.24		1.63	.84			.99	2.50	.18	4.74
Enlisted	3.23	3.28	3.59	3.25	2.34	3.59	2.79	1.94	3.42	2.96	2.04	2.57	2.21	3.51	3.17
Discharges—															
Enlisted	2.09	2.04	2.50	2.00	2.30	2.88	2.18	.74	1.45	4.26	1.67		.89	2.77	1.96
Deaths—															
Officers	.07	.07													.07
Enlisted	.01	.01													.01

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.	Nativities.											Length of service (years).	
		United States.	Ireland.	Germany.	England.	Canada.	Scandinavia.	Scotland.	Switzerland.	Austria.	Denmark.	France.	All others.	Under one.	One and over.
GROUPED—continued.															
Diseases of the integument and subcutaneous connective tissue:															
Admissions—															
Officers	28.21	28.17	41.03	10.53					76.92			40.00	117.64	6.02	28.57
Enlisted	79.97	85.39	62.62	72.19	76.26	82.84	64.88	68.26	92.97	78.87	72.54	81.74	71.50	137.76	68.87
Noneffective—															
Officers	1.17	1.08	5.56	.17					4.00			7.77	3.46	.10	1.18
Enlisted	1.99	2.08	1.81	1.92	1.79	1.85	1.51	2.21	2.20	1.55	1.51	2.54	1.95	3.17	1.77
Discharges—															
Enlisted	.15	.17	.10	.15	.16						.56			.25	.13
Deaths—															
Officers	.07	.07													.07
Enlisted	.01	.01													.01
Diseases of the organs of special sense:															
Admissions—															
Officers	23.78	23.22	20.51	52.63	72.73		90.91		76.92			80.00	29.41		24.16
Enlisted	26.95	28.04	24.40	23.42	23.35	24.51	31.71	29.37	31.25	23.60	27.58	32.32	27.57	39.36	24.56
Noneffective—															
Officers	2.80	2.76	4.45	8.33	2.89		1.49		.21			1.31	.56		2.85
Enlisted	1.05	1.06	.93	.95	.92	1.00	1.31	1.12	1.28	.93	1.31	2.99	1.79	1.50	.97
Discharges—															
Enlisted	1.56	1.50	1.40	1.64	1.97	1.92	1.36	1.47	1.45	2.13	2.22	1.76	2.67	2.23	1.43
Deaths—															
Enlisted	.02	.03												.07	.01
Unclassified:															
Admissions—															
Officers	.19	.20													.19
Enlisted	3.03	3.47	2.16	2.65	1.42	2.07	2.94	2.38		3.45	.60		2.56	8.54	1.97
Noneffective—															
Officers	.02	.02													.02
Enlisted	.06	.09	.05	.05	.62	.02	.07	.16		.26	.002		.07	.24	.05
Deaths—															
Enlisted	.01	.01													.01

General injuries:														
Admissions—														
Officers	3.02	2.88				18.52		31.25					29.41		3.07
Enlisted	4.21	4.14	4.91	4.31	3.01	5.52	4.40	2.38	3.13	4.61	3.00	9.51	3.21	6.39	3.79
Noneffective—															
Officers	.07	.07				.15		.09					2.01		.07
Enlisted	.08	.07	.11	.08	.11	.06	.18	.01	.17	.06	.08	.06	.04	.10	.08
Discharges—															
Enlisted	.03	.02	.10				.27							.04	.03
Deaths—															
Officers	.34	.28					66.67								.34
Enlisted	.93	.85	1.10	.87	.98	.96	1.63	.74	1.45	2.67	.56	1.76	1.19	.99	.92
Injuries to special parts:															
Admissions—															
Officers	70.59	69.64	61.54	63.15	200.00	55.56	90.91	93.75	76.92	250.00			235.30	12.05	71.52
Enlisted	266.44	275.22	278.06	227.46	240.98	284.78	257.78	255.56	243.75	237.77	214.63	288.97	223.15	408.52	239.15
Noneffective—															
Officers	5.08	4.95	3.82	6.54	13.89	.66	16.92	34.65		10.95			12.40	.28	5.16
Enlisted	8.57	8.61	9.46	7.84	7.99	9.04	8.79	10.77	7.15	7.43	7.47	8.03	7.37	12.20	7.87
Discharges—															
Enlisted	3.06	3.15	2.90	2.87	2.30	3.84	2.72	2.94	1.45	4.26	3.89	3.52	2.67	4.86	2.71
Deaths—															
Officers	.87	.85					66.67								.89
Enlisted	1.42	1.46	1.30	1.59	.98	1.28	1.63	2.94	.72	1.07		3.52	.59	1.24	1.45
Total for diseases:															
Admissions—															
Officers	692.08	683.30	758.98	863.15	1,018.18	611.11	818.18	656.25	1,230.77	750.00		880.00	1,676.47	228.92	699.46
Enlisted	988.25	1,043.43	962.05	810.10	907.11	1,033.14	886.08	852.38	893.75	807.14	836.93	1,049.43	821.42	1,707.26	850.14
Noneffective—															
Officers	39.12	37.40	62.26	99.99	56.84	55.16	24.64	36.02	18.53	15.74		204.12	89.62	8.44	39.61
Enlisted	28.98	30.74	26.87	24.67	23.56	32.81	26.55	25.64	27.82	21.63	26.21	30.89	23.90	49.47	25.04
Discharges—															
Enlisted	13.32	12.98	14.52	13.20	12.46	18.87	13.33	12.50	12.31	16.53	13.33	10.56	13.66	20.04	12.02
Deaths—															
Officers	8.35	8.35	10.99	7.52	12.82	13.33									8.48
Enlisted	4.17	3.96	5.46	4.14	4.26	4.16	5.17	1.47	2.90	2.67	5.55	7.04	3.86	4.40	4.13
Total for injuries:															
Admissions—															
Officers	73.61	72.52	61.54	63.15	200.00	74.07	90.91	125.00	76.92	250.00			264.71	12.05	74.58
Enlisted	270.65	279.36	282.97	231.77	243.99	290.30	262.18	257.94	246.88	242.37	217.63	298.48	226.35	414.91	242.93
Noneffective—															
Officers	5.15	5.02	3.82	6.54	13.89	.81	16.92	34.73		10.95			14.41	.28	5.23
Enlisted	8.65	8.68	9.57	7.93	8.10	9.10	8.97	10.78	7.32	7.50	7.55	8.08	7.42	12.29	7.95
Discharges—															
Enlisted	3.09	3.16	3.00	2.87	2.30	3.84	2.99	2.94	1.45	4.26	3.89	3.52	2.67	4.90	2.74
Deaths—															
Officers	1.21	1.13					133.33								1.23
Enlisted	2.35	2.31	2.40	2.46	1.97	2.24	3.26	3.68	2.17	3.73	.56	5.28	1.78	2.23	2.37

TABLE XVII.—*The relations of certain diseases and classes of disease to the several arms of the service, etc.*—Continued.

Causes of admission to sick report.	Total.	Nativities.											Length of service (years).	
		United States.	Ireland.	Germany.	England.	Canada.	Scandinavia.	Scotland.	Switzerland.	Austria.	Denmark.	France.	All others.	Under one.	One and over.
GROUPED—continued.															
Total for all causes:															
Admissions—															
Officers	765.69	755.83	820.51	926.31	1,218.18	685.18	909.09	781.25	1,307.69	1,000.00	.....	880.00	1,941.18	240.96	774.04
Enlisted	1,258.90	1,322.79	1,245.02	1,041.87	1,151.10	1,323.44	1,148.27	1,110.32	1,140.63	1,049.51	1,054.56	1,347.91	1,047.77	2,122.17	1,093.07
Noneffective—															
Officers	44.27	42.42	66.08	106.53	70.73	55.97	41.56	70.75	18.53	26.69	.....	204.12	104.03	8.72	44.84
Enlisted	37.63	39.42	36.44	32.60	31.06	41.91	35.52	36.42	35.15	29.13	33.75	38.97	31.32	61.76	32.99
Discharges—															
Enlisted	16.40	16.15	17.52	16.07	14.76	22.71	16.32	15.44	13.76	20.79	17.21	14.08	16.33	24.94	14.76
Deaths—															
Officers	9.56	9.48	10.99	7.52	12.82	13.33	133.33	.....	.....	.....	.....	.....	.....	.....	9.71
Enlisted	6.52	6.27	7.86	6.60	6.23	6.40	8.43	5.15	5.07	6.40	6.11	12.32	5.64	6.63	6.50

TABLE XVIII.—*Number of white and colored applicants for enlistment physically examined during the year 1896, with the number accepted, rejected on primary examination, and declined, and ratios per thousand.*

	White.		Colored.		Total.	
	Number.	Ratio per 1,000 white examined.	Number.	Ratio per 1,000 colored examined.	Number.	Ratio per 1,000 examined.
Examined	13,535	1,000.00	1,124	1,000.00	14,659	1,000.00
Accepted	7,986	590.02	668	594.31	8,654	590.35
Rejected on primary examination	5,022	371.04	426	379.00	5,448	371.65
Declined	527	38.94	30	26.69	557	38.00

In addition to the foregoing, 60 Indians were examined, of whom 30 were enlisted as soldiers and 30 as scouts.

TABLE XIX.—*Nativity of white and negro recruits accepted during the year 1896, with ratios per thousand accepted.*

Nativity.	White.		Colored.		Total.	
	Number.	Ratio per 1,000 accepted.	Number.	Ratio per 1,000 accepted.	Number.	Ratio per 1,000 accepted.
United States	5,835	674.26	663	76.61	6,498	750.87
England	218	25.20	.....	.....	218	25.20
Scotland	37	4.27	.....	.....	37	4.27
Wales	7	.81	.....	.....	7	.81
Ireland	643	74.30	.....	.....	643	74.30
Canada	131	15.14	2	.23	133	15.37
Other British possessions	6	.69	.....	.....	6	.69
France	14	1.62	.....	.....	14	1.62
Belgium	5	.58	.....	.....	5	.58
Holland	13	1.50	.....	.....	13	1.50
Denmark	70	8.09	.....	.....	70	8.09
Norway	46	5.31	.....	.....	46	5.31
Sweden	101	11.67	.....	.....	101	11.67
Germany	645	74.53	.....	.....	645	74.53
Switzerland	40	4.62	.....	.....	40	4.62
Austria	62	7.16	.....	.....	62	7.16
Bohemia	14	1.62	.....	.....	14	1.62
Hungary	7	.81	.....	.....	7	.81
Poland	14	1.62	.....	.....	14	1.62
Russia	49	5.66	.....	.....	49	5.66
Finland	4	.46	.....	.....	4	.46
Italy	13	1.50	.....	.....	13	1.50
Other countries	12	1.39	3	.35	15	1.74
Total foreign	2,151	248.55	5	.58	2,156	249.13
Total	7,986	922.81	668	77.19	8,654	1,000.00

TABLE XX.—*Causes of rejection on primary examination among 14,659 recruits physically examined during the year 1896, with corresponding ratios per thousand of each race examined.*

Number examined	White, 13,535.		Colored, 1,124.		Total, 14,659.	
Cause of rejection.	Number rejected.	Ratio per 1,000.	Number rejected.	Ratio per 1,000.	Number rejected.	Ratio per 1,000.
Venereal diseases	191	14.11	45	40.03	236	16.10
Other infectious diseases	40	2.96	8	7.12	48	3.27
Diseases of nutrition, general	4	.30	.....	.....	4	.27
Diseases of the nervous system	6	.44	1	.89	7	.48
Diseases of the digestive system	287	21.20	23	20.46	310	21.15
Diseases of the circulatory system	421	31.10	24	21.35	445	30.36
Diseases of the respiratory organs	14	1.03	1	.89	15	1.02
Diseases of the genito-urinary system	470	34.72	19	16.90	489	33.36
Diseases of the lymphatic system, and ductless glands	23	1.70	4	3.56	27	1.84
Diseases of the muscles, bones, and joints	57	4.21	10	8.90	67	4.57
Diseases of the integument and subcutaneous connective tissue	116	8.57	9	8.01	125	8.53
Diseases of the eye	722	53.34	33	29.36	755	51.50
Diseases of the ear	60	4.43	.....	.....	60	4.09
Diseases of the nose	27	1.99	2	1.78	29	1.98
Hernia	91	6.72	8	7.12	99	6.75
Other injuries	54	3.99	4	3.56	58	3.96
Over height	5	.37	2	1.78	7	.48
Under height	71	5.25	9	8.01	80	5.46
Over weight and obesity	49	3.62	3	2.67	52	3.55
Under weight	608	44.92	37	32.92	645	44.00
Imperfect physique	835	61.69	72	64.05	907	61.87
Mental insufficiency	17	1.26	2	1.78	19	1.30
Over age	15	1.11	2	1.78	17	1.16
Minors	169	12.49	6	5.34	175	11.94
Married, or having dependent relatives	44	3.25	5	4.45	49	3.34
Illiteracy	51	3.77	36	32.03	87	5.93
Imperfect knowledge of English	61	4.51	.....	.....	61	4.16
Reenlistment disapproved for various reasons	6	.44	2	1.78	8	.55
Character bad or doubtful	100	7.39	8	7.12	108	7.37
References, none or unsatisfactory	148	10.93	13	11.56	161	10.98
Aliens	28	2.07	.....	.....	28	1.91
General unfitness and undesirable	161	11.90	14	12.45	175	11.94
No vacancies	6	.44	22	19.57	28	1.91
Unclassified	65	4.80	2	1.78	67	4.57
Total	5,022	371.04	426	379.00	5,448	371.65

TABLE XXI.—*Average height, weight, and chest measure of 8,654 recruits accepted*

Age.	Whole number accepted.					Average height (in inches).				
	White.			Colored.	Total white and colored.	White.			Colored.	Total white and colored.
	Native.	Foreign born.	Total.			Native.	Foreign born.	Total.		
16	23	1	24	.....	24	65.29	68.25	65.42	.....	65.42
17	11	1	12	.....	12	66.98	62.25	66.58	.....	66.58
18	5	3	8	1	9	66.80	66.75	66.78	66.50	66.75
19	5	2	7	1	8	67.10	66.25	66.86	65.50	66.69
Under 20 (average, 17)	44	7	51	2	53	66.09	66.18	66.10	66.00	66.10
20	3	1	4	.....	4	66.75	67.25	66.88	.....	66.88
21	1,584	174	1,758	112	1,870	67.72	67.10	67.66	67.18	67.63
22	696	120	816	61	877	67.67	67.04	67.57	67.57	67.57
23	472	82	554	33	587	67.86	67.05	67.74	67.20	67.71
24	525	138	663	38	701	67.91	67.21	67.77	67.01	67.73
20 to 24 (average, 22)	3,280	515	3,795	244	4,039	67.76	67.11	67.67	67.25	67.65
25	399	137	536	44	580	67.64	67.22	67.53	67.31	67.51
26	449	197	646	48	694	67.93	67.25	67.72	67.56	67.71
27	282	142	424	36	460	67.75	67.29	67.59	67.15	67.56
28	257	132	389	28	417	67.93	67.16	67.67	67.63	67.66
29	163	122	285	19	304	67.70	66.82	67.32	67.87	67.36
25 to 29 (average, 26.7)	1,550	730	2,280	175	2,455	67.80	67.17	67.59	67.46	67.58
30	103	79	182	12	194	67.78	67.31	67.58	66.79	67.53
31	106	96	202	29	231	67.70	67.34	67.52	67.54	67.53
32	81	85	166	23	189	67.69	66.93	67.30	67.39	67.31
33	73	56	129	6	135	67.86	67.31	67.62	67.75	67.62
34	46	56	102	13	115	67.96	67.44	67.67	66.50	67.54
30 to 34 (average, 31.7)	409	372	781	83	864	67.77	67.25	67.52	67.24	67.50
35	48	41	89	5	94	67.48	67.13	67.32	68.25	67.37
36	59	53	112	23	135	67.29	67.06	67.18	67.29	67.20
37	59	45	104	10	114	67.23	67.03	67.14	66.60	67.09
38	45	32	77	14	91	67.27	66.84	67.09	66.84	67.05
39	29	29	58	16	74	66.93	67.41	67.17	67.22	67.18
35 to 39 (average, 36.1)	240	200	440	68	508	67.27	67.08	67.18	67.15	67.18
40 to 49 (average, 44.1)	265	245	510	85	595	67.19	66.97	67.09	67.83	67.19
50 and over (average, 52.8)	47	82	129	11	140	67.39	66.96	67.12	67.29	67.13
16 and over (average, 27.1)	5,835	2,151	7,986	668	8,654	67.71	67.13	67.55	67.36	67.54

during the year 1896 (native white, 5,835; foreign-born white, 2,151; colored, 668).

Average weight (in pounds).					Average chest measure (in inches).									
White.			Colored.	Total white and colored.	White.						Colored.		Total white and colored.	
					Native.		Foreign born.		Total.					
Native.	Foreign born.	Total.			Expiration.	Inspiration.	Expiration.	Inspiration.	Expiration.	Inspiration.	Expiration.	Inspiration.	Expiration.	Inspiration.
117.39	129.00	117.88	.....	117.88	30.66	33.63	30.00	35.00	30.64	33.69	.....	.....	30.64	33.69
125.64	103.00	123.75	.....	123.75	31.55	34.48	29.25	31.50	31.35	34.23	.....	.....	31.35	34.23
122.80	132.67	126.50	127.00	126.56	31.15	33.95	33.33	36.08	31.97	34.75	32.00	34.00	31.97	34.67
138.80	128.50	135.86	148.00	137.38	33.40	36.40	32.00	35.63	33.00	36.18	32.50	35.00	32.94	36.03
122.50	126.71	123.08	137.50	123.62	31.25	34.19	31.89	35.14	31.34	34.32	32.25	34.50	31.37	34.33
138.33	138.00	138.25	.....	138.25	33.00	35.92	36.50	39.50	33.88	36.81	.....	.....	33.88	36.81
142.26	142.24	142.26	142.20	142.25	33.75	36.64	34.03	36.97	33.78	36.68	33.53	36.01	33.77	36.64
143.38	144.06	143.48	145.80	143.64	34.00	36.89	34.40	37.24	34.06	36.94	33.88	36.48	34.04	36.91
145.21	144.66	145.13	147.21	145.24	34.15	37.01	34.34	37.28	34.18	37.05	34.30	36.95	34.19	37.05
145.71	145.73	145.72	147.16	145.80	34.18	37.12	34.59	37.67	34.27	37.23	33.78	36.34	34.24	37.19
143.47	143.98	143.54	144.55	143.60	33.93	36.82	34.32	37.27	33.98	36.89	33.76	36.31	33.97	36.85
144.00	146.07	144.53	144.89	144.55	34.10	37.06	34.43	37.50	34.18	37.18	33.71	36.28	34.15	37.11
145.98	147.41	146.42	152.92	146.87	34.24	37.20	34.74	37.86	34.39	37.40	34.55	37.27	34.40	37.39
146.98	147.87	147.28	146.83	147.24	34.29	37.28	34.65	37.75	34.41	37.44	33.88	36.56	34.37	37.37
148.19	147.08	147.81	148.29	147.84	34.47	37.47	34.81	37.91	34.59	37.61	34.28	36.89	34.56	37.57
148.09	147.23	147.72	157.68	148.35	34.56	37.53	34.68	37.60	34.61	37.56	34.62	37.28	34.61	37.54
146.24	147.16	146.53	149.42	146.74	34.28	37.26	34.67	37.74	34.41	37.41	34.16	36.82	34.39	37.37
149.64	146.54	148.30	149.75	148.39	34.74	37.74	34.76	37.84	34.75	37.78	34.21	37.13	34.72	37.74
148.70	149.06	148.87	150.93	149.13	34.45	37.36	34.85	38.09	34.64	37.71	34.09	36.91	34.57	37.61
149.32	149.01	149.16	152.96	149.62	34.59	37.63	34.90	37.87	34.75	37.75	34.35	37.03	34.70	37.66
147.25	152.13	149.36	153.33	149.54	34.26	37.30	35.38	38.27	34.75	37.72	34.92	37.67	34.76	37.72
152.74	146.95	149.56	154.46	150.11	34.69	37.81	34.77	37.89	34.73	37.85	35.12	37.71	34.78	37.84
149.25	148.66	148.97	152.05	149.27	34.54	37.55	34.91	37.98	34.72	37.76	34.40	37.15	34.69	37.70
150.08	149.07	149.62	157.20	150.02	35.21	37.98	34.78	38.05	35.01	38.01	35.45	38.45	35.03	38.04
150.32	148.15	149.30	154.96	150.26	34.88	37.83	35.17	38.14	35.02	37.97	34.58	37.36	34.94	37.87
149.02	152.69	150.61	143.70	150.00	34.83	37.72	35.71	38.76	35.21	38.17	33.43	35.90	35.05	37.97
151.78	150.66	151.31	155.79	152.00	34.64	37.69	35.18	38.14	34.87	37.88	35.82	38.71	35.01	38.01
151.34	149.24	150.29	152.88	150.85	34.78	37.62	34.84	37.82	34.81	37.72	34.61	37.06	34.76	37.58
150.35	149.92	150.15	153.15	150.56	34.88	37.78	35.16	38.21	35.01	37.98	34.74	37.43	34.97	37.91
154.29	152.36	153.36	157.80	153.99	35.56	38.38	35.42	38.29	35.49	38.34	34.86	37.55	35.40	38.22
157.98	147.24	151.16	158.09	151.70	35.82	38.47	35.01	37.74	35.30	38.00	35.61	38.39	35.33	38.04
145.34	147.44	145.91	149.52	146.19	34.18	37.09	34.76	37.77	34.33	37.28	34.21	36.85	34.32	37.24

INTERNATIONAL TABLE I.—*Examination of recruits during the year 1896.*

No.		White.	Colored.	Total.
1	Total number of recruits examined	13,535	1,124	14,659
	Of each 1,000 of these—			
2	Were accepted for service	590.02	594.31	590.35
3	Were rejected for under height	5.25	8.01	5.46
4	Were rejected for disabilities	365.79	370.99	366.19
	Of each 1,000 accepted recruits the heights were as follows (in inches):			
5	Under 61	.....	.....	.....
6	61 to 62	.50	.....	.46
7	62 to 63	2.25	2.99	2.31
8	63 to 64	7.51	8.98	7.63
9	64 to 65	78.14	77.85	78.11
10	65 to 66	130.35	173.65	133.70
11	66 to 67	171.80	172.16	171.83
12	67 to 68	187.45	182.64	187.08
13	68 to 69	165.92	152.69	164.89
14	69 to 70	116.71	110.78	116.25
15	70 to 71	74.13	59.88	73.03
16	71 to 72	38.32	32.94	37.90
17	72 to 73	18.53	13.47	18.14
18	73 to 74	5.51	8.98	5.78
19	74 upward	2.88	2.99	2.89
	Causes of rejection (exclusive of under height) expressed in ratios per 1,000 of examined recruits:			
20	Physical debility	.30	.....	.27
21	Tuberculosis of lungs or other organs	2.29	5.34	2.52
22	Imperfect vision	51.64	28.47	49.87
23	Heart disease	14.26	16.90	14.46
24	Goiter	.15	.89	.20
25	Varicose veins, varicocele, hemorrhoids	54.30	19.57	51.65
26	Hernia	6.72	7.12	6.75
27	Flat feet	3.99	2.67	3.89

INTERNATIONAL TABLE II.—*Movements of sick by departments.* (*a*)

	Mean strength.	Admitted sick.			Sick disposed of.				Total days sick.
		To quarters.	To hospital.	Total admissions.	Returned to duty (recovered).	Died. (*b*)	Otherwise disposed of.	Total.	
Department of the East	7,416	3,336	6,232	9,568	9,296	27	261	9,584	90,976
Department of the Missouri	4,002	2,218	2,558	4,776	4,597	20	157	4,774	55,873
Department of Dakota	2,286	673	1,148	1,821	1,743	5	65	1,813	23,796
Department of the Platte	2,390	840	2,084	2,924	2,846	6	60	2,912	29,415
Department of Texas	1,620	810	1,204	2,014	1,955	11	46	2,012	22,065
Department of the Colorado	2,892	1,098	2,231	3,329	3,197	12	82	3,291	34,256
Department of California	1,440	374	745	1,119	1,071	3	33	1,107	12,576
Department of the Columbia	1,404	380	888	1,268	1,227	1	41	1,269	14,146
General hospital and at large	37	2	14	16	53	1	23	77	8,206
The Army	23,487	9,731	17,104	26,835	25,985	86	768	26,839	291,309

	In 1,000 of mean strength.			In 1,000 sick disposed of.			Average days sickness to each person.	
	Total admissions.	Admissions to hospital.	Deaths.	Returned to duty.	Died.	Otherwise disposed of.	Of mean strength.	Of total sick disposed of.
Department of the East	1,290.18	840.35	3.64	969.95	2.82	27.23	12.27	9.49
Department of the Missouri	1,193.40	639.18	5.00	962.92	4.19	32.89	13.96	11.70
Department of Dakota	796.58	502.19	2.19	961.39	2.76	35.85	10.41	13.13
Department of the Platte	1,223.43	871.96	2.51	977.34	2.06	20.60	12.31	10.10
Department of Texas	1,243.21	743.21	6.79	971.67	5.47	22.86	13.62	10.97
Department of the Colorado	1,151.11	771.44	4.15	971.44	3.65	24.92	11.85	10.41
Department of California	777.08	517.36	2.08	967.48	2.71	29.81	8.73	11.36
Department of the Columbia	903.13	632.48	.71	966.90	.79	32.31	10.07	11.15
General hospital and at large	432.43	378.38	27.03	688.31	12.99	298.70	221.78	106.57
The Army	1,142.55	728.24	3.66	968.18	3.20	28.62	12.40	10.85

a Officers and citizen employees not included. *b* Exclusive of suicides and fatal accidents.

INTERNATIONAL TABLE III.—*Movements of sick by branches of military service and by months.*

	Absolute numbers.						Proportions per 1,000.				
		Sick admissions.		Sick disposed of.			In 1,000 of mean strength there were—			In 1,000 sick disposed of there were—	
	Mean strength.	Total.	To hospital.	Total.	As fit for duty (recovered).	By death.	Total sick admissions.	Admissions to hospital.	Deaths.	Fit for duty (recovered).	Deaths.
ARM OF SERVICE.											
Infantry	11,930	12,735	8,145	12,835	12,422	22	1,067.48	682.73	1.84	967.82	1.71
Cavalry	5,679	7,496	4,552	7,376	7,138	36	1,319.95	801.55	6.34	967.73	4.88
Artillery	3,631	4,876	3,352	4,932	4,791	17	1,342.88	923.16	4.68	971.41	3.45
Ordnance	536	514	94	495	476	5	958.96	175.37	9.33	961.62	10.10
Engineers	440	601	547	601	592	....	1,365.91	1,243.18	.....	985.03	.....
Medical Department	667	317	207	300	281	3	475.26	310.34	4.50	936.67	10.00
All others	604	296	207	300	285	3	490.07	342.72	4.97	950.00	10.00
MONTH.											
January	23,788	2,450	1,700	2,312	2,197	10	103.00	71.46	.42	950.26	4.33
February	23,585	2,192	1,473	2,161	2,089	6	92.94	62.46	.25	966.68	2.78
March	23,721	2,287	1,480	2,289	2,218	5	96.42	62.39	.21	968.98	2.18
April	23,476	2,139	1,389	2,219	2,147	7	91.12	59.17	.30	967.55	3.15
May	23,399	2,238	1,464	2,293	2,212	7	95.65	62.57	.30	964.68	3.05
June	23,212	2,152	1,250	2,073	2,022	3	92.71	53.86	.13	975.40	1.45
July	23,431	2,426	1,373	2,322	2,250	6	103.54	58.60	.26	968.99	2.58
August	23,249	2,676	1,576	2,722	2,651	3	115.10	67.79	.13	973.92	1.10
September	23,671	2,273	1,320	2,270	2,208	11	96.02	55.76	.46	972.69	4.85
October	23,021	1,906	1,290	2,096	2,021	12	82.79	56.04	.52	964.22	5.73
November	23,612	1,954	1,340	1,884	1,833	6	82.76	56.75	.25	972.93	3.18
December	23,710	2,142	1,449	2,198	2,137	10	90.34	61.12	.42	972.25	4.55

INTERNATIONAL TABLE IV.—*Movements of sick by larger garrisons.*

Garrison.	Mean enlisted strength.	In 1,000 of mean strength.			Garrison.	Mean enlisted strength.	In 1,000 of mean strength.		
		Total admissions.	Admissions to hospital.	Deaths.			Total admissions.	Admissions to hospital.	Deaths.
Adams, Fort, R. I	269	962.83	553.90	.....	Missoula, Fort, Mont.	258	651.16	546.51	7.75
Apache, Fort, Ariz	312	814.10	365.38	.....	Monroe, Fort, Va	490	1,612.25	436.73	.....
Assiniboine, Fort, Mont	407	523.34	425.06	2.46	Myer, Fort, Va	265	2,362.26	1,841.51	7.55
Bayard, Fort, N. Mex	334	925.15	826.35	.....	Niobrara, Fort, Nebr	478	1,215.48	1,016.74	6.28
Clark, Fort, Tex	352	2,028.41	599.43	.....	Plattsburg Barracks, N. Y	489	955.01	562.37	4.09
Columbus Barracks, Ohio	443	1,212.19	1,009.03	4.51	Presidio of San Francisco, Cal	532	983.08	825.19	1.88
Crook, Fort, Nebr	471	1,218.68	764.33	4.25	Reno, Fort, Okla	334	895.21	326.35	.....
Custer, Fort, Mont	324	811.73	629.63	6.17	Riley, Fort, Kans	780	1,641.03	717.95	3.85
D. A. Russell, Fort, Wyo	439	1,676.54	1,330.30	.....	Robinson, Fort, Nebr.	357	1,030.81	691.88	14.01
Douglas, Fort, Utah	482	983.40	848.55	6.22	Sam Houston, Fort, Tex	613	807.50	725.94	16.31
Grant, Fort, Ariz	281	1,192.17	761.57	7.12	Sheridan, Fort, Ill	689	1,091.44	635.70	4.35
Hamilton, Fort, N. Y	253	1,106.72	1,051.38	.....	Sherman, Fort, Idaho	265	1,011.32	630.19	3.77
Jefferson Barracks, Mo	327	1,593.27	1,162.08	15.29	Sill, Fort, Okla	389	1,097.69	370.18	10.28
Keogh, Fort, Mont	271	1,011.07	361.62	7.38	Snelling, Fort, Minn	455	1,010.99	659.34	2.20
Leavenworth, Fort, Kans	672	1,197.92	733.63	7.44	Thomas, Fort, Ky	456	1,471.49	1,008.77	6.58
Logan, Fort, Colo	548	1,410.58	1,239.05	5.47	Vancouver Barracks, Wash	532	847.74	580.83	3.76
Madison Barracks, N. Y	450	1,048.88	420.00	6.67	Washington Barracks, D. C	330	2,366.67	2,290.90	3.03
McPherson, Fort, Ga	501	1,019.96	556.89	11.98	West Point, N. Y	330	1,515.15	1,303.03	.....
Meade, Fort, S. Dak	433	1,004.62	792.15	.....	Willets Point, N. Y	389	1,069.41	987.15	.....

INTERNATIONAL TABLE V.—*Movements of sick, according to most important diseases.*

No.	Diseases of the international nosological table.	Remaining under treatment at close of year 1895.	Admitted in 1896.	Total remaining and admitted.	Disposed of in 1896—				Remaining under treatment at close of year 1896.	Total days sick in 1896.	In 1,000 of mean strength.		In 1,000 disposed of—			Sick days to each case of the total disposed of.
					As fit for duty (recovered).	Died.	Otherwise.	Total.			Admissions.	Deaths.	Fit for duty (recovered).	Died.	Otherwise.	
1	Alcoholismus acutus, including delirium tremens	15	665	680	654	3	17	674	6	2,871	28.31	.13	970.33	4.45	25.22	4.26
2	Bronchitis acuta	21	1,454	1,475	1,427	.....	12	1,439	36	7,251	61.91	.....	991.66	.....	8.34	5.04
3	Cholera asiatica	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	Cholera nostras	.....	69	69	69	.....	.....	69	.....	222	2.94	.....	1,000.00	.....	.....	3.22
5	Diphtheria et croup	7	46	53	52	.....	.....	52	1	818	1.96	.....	1,000.00	.....	.....	15.73
6	Dysenteria	1	48	49	45	.....	2	47	2	508	2.04	.....	957.45	.....	42.55	10.81
7	Erysipelas	1	27	28	23	.....	3	26	2	502	1.15	.....	884.62	.....	115.38	19.31
8	Febris intermittens (malaria)	7	1,723	1,730	1,704	.....	16	1,720	10	8,656	73.36	.....	990.70	.....	9.30	5.03
9	Febris recurrens	6	278	284	275	1	4	280	4	5,033	11.84	.04	982.14	3.57	14.29	17.98
10	Gonorrhœa	78	1,264	1,342	1,201	.....	58	1,259	83	27,682	53.82	.....	953.93	.....	46.07	21.99
11	Hernia	12	74	86	55	.....	16	71	15	4,551	3.15	.....	774.65	.....	225.35	64.10
12	Influenza	6	846	852	811	1	14	826	26	5,861	36.02	.04	981.84	1.21	16.95	7.10
13	Insolatio (Hitzschlag, coup de chaleur)	2	23	25	24	.....	1	25	.....	77	.98	.....	960.00	.....	40.00	3.08
14	Meningitis cerebro-spinalis epidemica	.....	1	1	1	.....	.....	1	.....	14	.04	.....	1,000.00	.....	.....	14.00
15	Morbilli	2	240	242	223	.....	13	236	6	3,324	10.22	.....	944.92	.....	55.08	14.08
16	Parotitis epidemica	4	68	72	67	.....	3	70	2	917	2.90	.....	957.14	.....	42.86	13.10
17	Pneumonia crouposa sive lobaris	6	46	52	41	5	2	48	4	1,305	1.96	.21	854.17	104.17	41.67	27.19
18	Rheumatismus articulorum	18	289	307	262	1	26	289	18	10,505	12.31	.04	906.57	3.46	89.97	36.35
19	Scarlatina	1	2	3	3	.....	.....	3	.....	45	.09	.....	1,000.00	.....	.....	15.00
20	Scorbutus	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
21	Syphilis	22	276	298	235	1	39	275	23	11,113	11.75	.04	854.55	3.64	141.82	40.41
22	Trachoma	.....	1	1	1	.....	.....	1	.....	151	.04	.....	1,000.00	.....	.....	151.00
23	Tuberculosis pulmonum	11	39	50	5	3	32	40	10	3,279	1.66	.13	125.00	75.00	800.00	81.98
24	Tuberculosis ceterorum organorum	2	12	14	5	2	6	13	1	1,101	.51	.09	384.62	153.85	461.54	84.69
25	Typhus abdominalis	8	145	153	111	16	4	131	22	7,559	6.17	.68	847.33	122.14	30.53	57.70
26	Typhus exanthematicus	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
27	Variola	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
28	Morbi auris	7	138	145	125	.....	14	139	6	2,126	5.88	.....	899.28	.....	100.72	15.30
29	Morbi cordis	8	88	96	47	8	30	85	11	3,818	3.75	.34	552.94	94.12	352.94	44.92
30	Morbi cutis	37	1,888	1,925	1,846	.....	35	1,881	44	15,704	80.39	.....	981.39	.....	18.61	8.35
31	Morbi mentis	40	1,409	1,449	1,329	10	76	1,415	34	14,114	59.99	.43	939.22	7.07	53.71	9.97
32	Morbi oculi	13	344	357	330	.....	17	347	10	4,352	14.65	.....	951.01	.....	48.99	12.54
33	Morbi systemat. urin. et sexual. (excl. ven. et syph.)	12	198	210	174	7	16	197	13	4,155	8.43	.30	883.25	35.53	81.22	21.09

INTERNATIONAL TABLE VI.—*Admissions of important diseases, by branches of military service.*

No.	Diseases of the international nosological table.	Absolute number of admissions.							Admissions per 1,000 of mean strength.						
		Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Hospital Corps.	All others.	Infantry.	Cavalry.	Artillery.	Ordnance.	Engineers.	Hospital Corps.	All others.
1	Alcoholismus acutus, including delirium tremens..	423	71	127	10	19	8	7	35.46	12.50	34.98	18.66	43.18	11.99	11.59
2	Bronchitis acuta	769	345	221	56	29	19	15	64.46	60.75	60.86	104.48	65.91	28.49	24.83
3	Cholera asiatica	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
4	Cholera nostras	14	8	38	6	3	.....	.....	1.17	1.41	10.47	11.19	6.82	.....	.....
5	Diphtheria et croup	34	8	.....	.....	.....	2	2	2.85	1.41	.....	.....	.....	3.00	3.31
6	Dysenteria	15	18	10	3	1	.....	1	1.26	3.17	2.75	5.60	2.27	.....	1.66
7	Erysipelas	12	8	3	2	.....	2	.....	1.01	1.41	.83	3.73	.....	3.00	.....
8	Febris intermittens (malaria)	274	488	711	34	138	49	29	22.97	85.93	195.82	63.44	313.64	73.46	48.01
9	Febris recurrens	74	116	54	7	9	8	10	6.20	20.43	14.87	13.06	20.46	11.99	16.56
10	Gonorrhœa	688	324	214	3	13	7	15	57.67	57.05	58.94	5.60	29.55	10.49	24.83
11	Hernia	34	20	15	1	1	2	1	2.85	3.52	4.13	1.87	2.27	3.00	1.66
12	Influenza	345	279	150	24	11	15	22	28.92	49.12	41.31	44.78	25.00	22.49	36.42
13	Insolatio (Hitzschlag, coup de chaleur)	13	5	4	.....	1	.....	.....	1.09	.88	1.10	.....	2.27	.....	.....
14	Meningitis cerebro-spinalis epidemica	1	.....	.....	.....	.....	.....	.....	.08	.....	.....	.....	.....	.....	.....
15	Morbilli	127	66	39	.....	2	6	.....	10.65	11.62	10.74	.....	4.55	9.00	.....
16	Parotitis epidemica	42	2	18	.....	5	.....	1	3.52	.35	4.96	.....	11.36	.....	1.66
17	Pneumonia crouposa sive lobaris	21	11	12	2	.....	.....	.....	1.76	1.94	3.30	3.73	.....	.....	.....
18	Rheumatismus articulorum	154	56	52	6	4	11	6	12.91	9.86	14.32	11.19	9.09	16.49	9.93
19	Scarlatina	.....	.....	2	.....	.....	.....	.....	.....	.....	.55	.....	.....	.....	.....
20	Scorbutus	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
21	Syphilis	137	73	51	2	10	2	1	11.48	12.85	14.05	3.73	22.73	3.00	1.66
22	Trachoma	1	.....	.....	.....	.....	.....	.....	.08	.....	.....	.....	.....	.....	.....
23	Tuberculosis pulmonum	20	12	7	.....	.....	.....	.....	1.68	2.11	1.93	.....	.....	.....	.....
24	Tuberculosis ceterorum organorum	6	5	.....	.....	.....	.....	1	.50	.88	.....	.....	.....	.....	1.66
25	Typhus abdominalis	66	55	17	.....	.....	5	2	5.53	9.68	4.68	.....	.....	7.50	3.31
26	Typhus exanthematicus	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
27	Variola	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
28	Morbi auris	73	35	24	2	1	1	2	6.12	6.16	6.61	3.73	2.27	1.50	3.31
29	Morbi cordis	51	18	16	1	.....	1	1	4.28	3.17	4.41	1.87	.....	1.50	1.66
30	Morbi cutis	772	625	398	28	41	12	12	64.72	110.05	109.61	52.24	93.18	17.99	19.87
31	Morbi mentis	820	209	261	42	32	21	24	68.74	36.80	71.89	78.36	72.74	31.48	39.74
32	Morbi oculi	192	92	47	5	3	.....	5	16.09	16.20	12.95	9.33	6.82	.....	8.28
33	Morbi systemat. urin. et sexual. (excl. ven. et syph.).	109	50	23	6	3	6	1	9.14	8.80	6.33	11.19	6.82	9.00	1.66

INTERNATIONAL TABLE VII.—*Admissions of important diseases by months (absolute numbers).*

No.	Diseases of the international nosological table.	Admissions by months.											
		Jan.	Feb.	Mar.	Apr.	May.	June.	July.	A	Sept.	Oct.	Nov.	Dec.
1	Alcoholismus acutus, including delirium tremens	54	43	53	70	57	55	61	65	66	49	48	44
2	Bronchitis acuta	277	176	173	98	73	52	61	48	84	106	130	176
3	Cholera asiatica												
4	Cholera nostras			1	1	3	8	27	12	10	1	5	1
5	Diphtheria et croup	29	10	4	1						1	1	
6	Dysenteria	2	2		4	3	8	10	6	5	2	1	5
7	Erysipelas	3	3		5	2	1	2		1	1		2
8	Febris intermittens (malaria)	48	26	60	97	134	200	243	357	257	180	80	41
9	Febris recurrens	10	3	2	9	14	13	33	102	57	21	10	4
10	Gonorrhœa	110	91	86	84	100	92	125	110	109	102	135	120
11	Hernia	7	6	9	7	4	5	6	8	7	4	5	6
12	Influenza	152	159	151	83	64	9	2	14	4	11	40	157
13	Insolatio (Hitzschlag, coup de chaleur)					1	1	12	9				
14	Meningitis cerebro-spinalis epidemica				1								
15	Morbilli	30	45	67	44	30	4	4	5	2		1	3
16	Parotitis epidemica	35	13	11	2	1	1	1				1	3
17	Pneumonia crouposa sive lobaris	7	8	6	6	1	1	1	3	1	2	3	7
18	Rheumatismus articulorum	31	20	31	24	35	17	25	20	31	25	14	16
19	Scarlatina										2		
20	Scorbutus												
21	Syphilis	37	21	24	18	22	23	20	21	19	26	21	24
22	Trachoma				1								
23	Tuberculosis pulmonum	1	2	5	7	4	1	2	3	2	2	5	5
24	Tuberculosis ceterorum organorum	4		1	1	2	1		1		1	1	
25	Typhus abdominalis	7	4	2	2	6	4	13	39	23	17	21	7
26	Typhus exanthematicus												
27	Variola												
28	Morbi auris	17	16	16	11	8	5	12	18	8	7	5	15
29	Morbi cordis	5	12	14	6	11	7	5	7	1	5	7	8
30	Morbi cutis	144	119	146	133	184	169	193	210	174	139	144	133
31	Morbi mentis	124	115	115	132	117	137	115	128	107	129	94	96
32	Morbi oculi	31	23	49	27	28	32	36	25	23	25	26	19
33	Morbi systemat. urin. et sexual. (excl. ven. et syph.)	15	23	12	16	14	12	20	21	17	16	18	14

INTERNATIONAL TABLE VIII.—*Deaths according to years of service and age.*

Causes of death.	Deaths.				
	Years of service.		Ages.		
	First year.	Second year and over.	Twentieth to twenty-fifth year.	Twenty-sixth to thirtieth year.	Thirty-first year and over.
Diseases	11	74	20	13	52
Suicides *a*	1	10	2	1	8
Accidents and injuries	7	33	19	9	12
Total	18	107	39	22	64

a Included in other classifications.

Respectfully submitted.

GEO. M. STERNBERG,
Surgeon-General, United States Army.

Hon. RUSSELL A. ALGER,
Secretary of War.

REPORT OF THE PAYMASTER-GENERAL.

ANNUAL REPORT

OF

THE PAYMASTER-GENERAL.

WAR DEPARTMENT,
PAYMASTER-GENERAL'S OFFICE,
Washington, September 28, 1897.

SIR: I have the honor to submit the following as the report of this office for the fiscal year ended June 30, 1897:

July 1, 1896, officers of the Pay Department were charged with public funds aggregating	$936,800.28
During fiscal year 1897 these officers received—	
From the United States Treasury	13,968,690.36
From soldiers' deposits	535,392.64
From army paymasters' collections	184,936.77
Total balances and receipts	15,625,820.05
Accounted for as follows:	
Expended on account of pay of the Army	13,830,331.02
Expended on account of mileage to officers	122,079.31
Expended on account of pay of Military Academy	296,743.63
Expended on account of volunteers (Treasury certificates)	458,654.22
Surplus funds deposited to credit of United States Treasurer	134,191.81
Army paymasters' collections deposited to credit United States Treasurer	184,936.77
Balances charged officers June 30, 1897	598,883.29
Total	15,625,820.05

Collections in favor of other Bureaus of the War Department.

Collections for the credit of appropriation for "Pay, etc., of the Army"	$110,928.42
Collected and turned into the Treasury to credit of—	
Quartermaster's Department	71,228.71
Subsistence Department[1]	222.70
Ordnance Department	1,593.50
Medical Department	12.40
Mileage to officers	576.95
Miscellaneous receipts	374.09
Total collections	184,936.77

[1] Collections on account of Subsistence Department were further made for credit sales to enlisted men and at once turned over to the commissary at the respective stations; the amount thus collected is not included in the above statement.

SOLDIERS' DEPOSITS.

Recapitulation of soldiers' deposits.

Fiscal year.	Number of deposits.	Amount deposited.	Fiscal year.	Number of deposits.	Amount deposited.
1873	.....	$209,850.38	1886	7,261	$469,031.55
1874	.....	346,609.56	1887	6,889	436,574.98
1875	.....	325,255.80	1888	7,409	386,944.10
1876	.....	435,912.68	1889	7,892	383,798.34
1877	5,524	328,585.05	1890	7,634	395,128.82
1878	5,524	346,243.94	1891	6,790	403,473.15
1879	6,807	470,770.38	1892	5,570	334,464.70
1880	8,635	477,174.44	1893	5,870	282,248.04
1881	8,942	524,112.72	1894	5,914	361,830.76
1882	6,890	448,561.83	1895	6,284	318,270.73
1883	7,902	407,544.68	1896	8,778	420,338.87
1884	7,114	389,267.55	1897	17,878	535,392.64
1885	7,033	427,617.96			

From the above it will be observed that while there is an increase of about 27 per cent in the amount deposited during the fiscal year 1897, as compared with fiscal year 1896, the number of depositors has also increased over 100 per cent, showing an economic thrift on the part of a larger number of the enlisted men, which usually indicates a more faithful class of soldiers.

During the fiscal year, $335,911.67 was paid on account of soldiers' deposits to men mustered out of service, leaving a credit to "Pay, etc., of the Army, 1897," of $199,480.97.

MILEAGE.

Disbursements, 1897 appropriation, from July 1, 1896, to June 30, 1897.

Change of station		$51,080.19
Inspection of the Army:		
By officers of Adjutant-General's Department	$427.65	
By officers of Inspector-General's Department	5,471.03	
By officers of Quartermaster's Department	2,079.68	
By officers of Subsistence Department	769.05	
By officers of Medical Department	1,117.72	
By officers of Pay Department	234.78	
By officers of Signal Corps	701.84	
By the General Commanding the Army and the generals commanding the several military departments, accompanied by their aids	3,914.68	
By officers of the Ordnance Department	4,767.43	
All other inspections of the Army	6,190.69	
Total for inspection of the Army		25,674.55
European travel		623.64
Recruiting duty		1,403.90
Boards of examination to examine officers for promotion		14,304.87
Retiring boards and officers retired and ordered home		5,576.62
Inspection and instruction of national guard		2,100.99
Travel of general officers and their aids, other than for inspection		2,952.24
Courts-martial—to and from		6,412.00
Payment of troops		765.25

Medical boards	$839.16
Boards of survey	27.52
Treasurer and professors Military Academy (Military Academy duty)	227.45
Attending funerals of officers and other deceased officials	170.82
Instructions of Secretary of War (confidential duty)	5,074.82
Total	117,214.02

By the act making appropriations for the support of the Army for the fiscal year ending June 30, 1898, the Pay Department was restricted to the payment of 4 cents per mile to officers traveling on duty without troops, transportation in kind to be furnished by the Quartermaster's Department, being substituted for the travel expenses heretofore paid by the officers themselves and reimbursed them by the Pay Department.

There still remains due officers a considerable sum in the aggregate on account of fares paid by them over "50 per cent" railroads, under the laws relating to land-grant and bond-aided railroads, as construed by the War Department and concurred in by the accounting officers of the Treasury until July 31, 1896, on which date the Comptroller of the Treasury decided that but 50 per cent of the cost of a travel fare ticket over land-grant roads, which had not received aid in bonds of the United States, would be admitted in the settlement of mileage accounts and proceeded to disallow against paymasters 50 per cent of such fares paid after the date stated.

Paymasters finding these sums disallowed in their accounts, declined to reimburse officers to a greater amount than would be allowed by the accounting officers of the Treasury, and as the Quartermaster's Department declined to furnish the officers with transportation requests, they were compelled in carrying out their orders to pay from their private means sums for which, under the decision of the Comptroller, they could not obtain reimbursement. An effort was made to obtain remedial legislation, as will appear from the following correspondence:

WAR DEPARTMENT, PAYMASTER-GENERAL'S OFFICE,
Washington, D. C., March 29, 1897.

SIR: As a measure of relief to those officers traveling on duty under orders, who, having paid full fare over what are known as "50 per cent railroads" have, under decision of the Comptroller of the Treasury, been reimbursed only one-half of the amount so paid; and also for the relief of paymasters who have paid officers so traveling the full amount of the fares paid by them over the railroads referred to, and have had one-half thereof disallowed by the Auditor for the War Department under said decision of the Comptroller, it is recommended that legislation be requested as follows:

Be it enacted, etc., That until the act making appropriations for the support of the Army for the fiscal year 1898 goes into effect, the Quartermaster's Department is hereby authorized to furnish transportation requests to officers traveling on duty under orders over what are known as 50 per cent railroads; the cost of such transportation to be reimbursed to the Quartermaster's Department from the appropriation known as "Mileage to officers traveling without troops": *And provided,* That officers who, by reason of the decision of the accounting officers of the Treasury, have been compelled to pay from their own means one-half of the cost of their

travel fare over said 50 per cent railroads, shall be reimbursed the same by the Pay Department, and paymasters against whom disallowances have been made by the accounting officers of the Treasury under such decision shall have the amounts so disallowed passed to their credit.

Very respectfully,

T. H. STANTON,
Paymaster-General, United States Army.

The SECRETARY OF WAR.
(Through Adjutant-General, United States Army.)

WAR DEPARTMENT,
Washington, May 10, 1897.

SIR: I have the honor to transmit herewith copy of letter from the Paymaster-General of the Army, recommending that legislation be requested to authorize the Quartermaster's Department to furnish transportation requests to officers traveling on duty over "50 per cent" railroads; and further, that amounts already paid by officers on that account be reimbursed them by the Pay Department; also submitting draft of the proposed act.

The question of removal of disallowance was referred to the Comptroller of the Treasury, who closes his decision as follows:

"I can not, therefore, sanction the removal of the disallowances without some additional legislation by Congress similar to that found in the proviso of the draft proposed by the Paymaster-General."

It is believed the legislation suggested by the Paymaster-General will provide the desired remedy.

Very respectfully,

R. A. ALGER, *Secretary of War.*

The PRESIDENT UNITED STATES SENATE.

It is hoped the legislation requested may be had during the coming session of Congress.

DEFICIENCIES.

It has been found that the appropriation of $12,963,512.73 for "Pay, etc., of the Army, 1897," is inadequate to meet the payments. On December 1, 1896, it was thought that $200,000 would cover the shortage, but owing to the fact that the present conditions are so different on account of new methods of payment under acts of February 12, 1895, and March 16, 1896, a close estimate could not be made, and it was not until the June accounts had been rendered that an estimate could be made with any degree of certainty.

During the twelve months ending June 30, 1897, there was disbursed on account of pay, etc., of the Army, 1897		$13,100,192.09
Estimated amount required to complete disbursements after July 1, 1897		810,000.00
Total required		13,910,192.09
Amount appropriated	$12,963,512.73	
Deficiency appropriated	200,528.90	
Received from soldiers' deposits	535,392.64	
Received from purchases of soldiers' discharge	8,169.00	
Received from collections	106,661.37	
		13,814,264.64
Balance required		95,927.45

The estimate submitted by this department for the fiscal year 1897 was $13,403,464.63, which, if allowed, with amounts derived from other sources, would have been sufficient to meet the payments to the Army for the fiscal year.

The amount appropriated for pay, etc., of the Army for 1898, is $13,048, 954.30. As the amount necessary to pay the Army in full for the year will doubtless equal the disbursements for the past fiscal year, there will be a probable deficiency for 1898 of about $450,000.

The estimates for the fiscal year 1899 for pay, etc., of the Army, have been carefully made, and it is desired that the full amount requested be allowed, as this Department should not be required to depend upon the uncertainties of a surplus of soldiers' deposits or accumulations from collections to make the payments to the Army. In fact, for the fiscal year 1899 it is expected that the soldiers' deposits will hardly meet the repayments, as a large proportion of the enlisted force of the Army will go out of service, it being the end of two enlistment periods, and the repayment of deposits will, it is thought, fully equal the deposits.

It is a source of regret to this office that each year it is found necessary to report a deficiency in the appropriation for the support of the Army. A comparison of the amount estimated as necessary to pay the Army with the amount actually disbursed will show that the excess of the estimates over the disbursements scarcely exceeds 1 per cent, which is not enough margin to provide such a working balance that paymasters in one department shall not be compelled to defer payment of part of the troops until funds can be transferred from some other department in which there may be a small surplus.

The estimates being carefully made, based on the known number of officers and enlisted men authorized by law (the only uncertain quantities being the amounts which may be required to pay for clothing, travel pay, service pay, and deposits of enlisted men, which items are, however, closely approximated by averaging the payments for a series of years), should not be reduced when the entire sum asked for scarcely affords such a working balance as to enable the Army to be paid promptly and in full.

MONTHLY PAYMENTS AND SYSTEM OF PAYMENTS.

All the military posts in the country have been paid monthly during the year, and with reasonable promptness. The officers of this Department have performed their duties intelligently, zealously, and with due regard to the interests of the Army and the Government. Their labors have been largely increased under the present methods of payment, while no corresponding benefit to the service has accrued. Payment by the paymaster in person is far more satisfactory to the troops and prevents vexatious delays to which the paymaster is now subjected in the rendition of his accounts. Under the former system, which has

been in existence since 1838, errors in muster rolls and in calculations of pay could be corrected at the pay table, while under the present system they can not. Another very serious objection to the present system is the absence of provision for the protection of the paymaster. He is a bonded officer, yet is required to turn over the public funds to several nonbonded officers, through whose hands the funds must pass before reaching the troops.

It is believed that if this fact were generally known paymasters would have much difficulty in procuring bond, either from individuals or from security companies. The responsibility of the paymaster and his bondsmen, as well as the opinions of those who have no responsibility for the public funds which they distribute, should be considered in connection with this question.

Satisfactory as the system may be in its working under the control of nonbonded officers, there are few instances in which it is preferred to the old system.

A DISBURSING SYSTEM FOR THE ARMY.

In the efforts made from year to year to bring the Army to as nearly a perfect organization as possible, the thorough and successful working of the supply departments is a matter of great importance. The time would seem to have arrived when a change from present methods of disbursing the appropriations for the Army should be earnestly considered. The attention of the honorable Secretary of War is therefore respectfully invited to the necessity of having one general disbursing department for the Army. At present the appropriations for the support of the military establishment are divided among the several staff corps. To simplify the duties of all the staff corps, the disbursement of the various appropriations should be confined to one department, having a corps of officers commissioned and bonded for this specific duty, under orders and regulations to be prescribed by the President and Secretary of War. At present there is no uniformity in the matter of bonding officers who are intrusted with public funds. The officers of the Quartermaster's, Subsistence, and Pay departments are required to be bonded, while officers of the Corps of Engineers and of the Ordnance Department are not so required.

Funds are turned over, under present regulations, by the bonded officers of the Pay Department to nonbonded officers of the line for distribution to the troops. Such irregularities would be impossible if the entire appropriations for the support of the Army, and for all military purposes whatsoever, were placed under the control of one disbursing bureau. This system prevails in some of the great armies of Europe, and meets with the strong approval of many officers of experience and high rank in our own.

In the interests of the public service and the necessity of introducing business methods into our system of disbursements, it is recommended that legislation to this effect be requested of Congress.

CLERKS TO ARMY PAYMASTERS.

I desire to call attention to a meritorious class of employees, whose duties require ability and faithfulness beyond the average, and who are the trusted and confidential assistants of bonded officers disbursing more than $13,000,000 per annum. I refer to the clerks of army paymasters, who, formerly selected by the paymasters themselves because of known ability and integrity, are now appointable only under the rules of the civil service.

Their duties are arduous and responsible; but under present laws there is no opportunity for promotion or advancement such as is afforded to civil employees in other branches of the military service, who may receive as high as $1,800 per annum.

A paymaster's clerk occupies a close confidential relation to the paymaster; and as the latter is charged with the disbursement of large sums of public money, he naturally prefers to have a clerk in whose honesty and integrity, as well as ability, he has the utmost confidence. I have the honor to recommend, therefore, that the selection of their clerks be left with the paymasters themselves, subject to the approval of the Secretary of War, and not subject to the rules of the civil service; and, further, to place them on an equality as to pay with clerks in other branches of the military and civil service, that they be granted an increase in pay for each five years' service not to exceed $1,800 per annum.

PERSONNEL.

Since date of last annual report, one paymaster, Col. J. P. Canby, assistant paymaster-general, having reached the age limit, was placed on the retired list to date January 7, 1897. By his retirement Lieut. Col. G. W. Candee, deputy paymaster-general, was promoted to colonel, assistant paymaster-general, and Maj. A. E. Bates was promoted to lieutenant-colonel, deputy paymaster-general. Two paymasters have been appointed, both from the Army: Maj. A. H. Jackson from captain, Seventh Infantry, and Maj. John L. Bullis from captain, Twenty-fourth Infantry. Maj. J. W. Wham remains under suspension.

Very respectfully,

T. H. STANTON,
Paymaster-General, United States Army.

The SECRETARY OF WAR.

Statement showing the number of pay trips made, number of days consumed in travel, posts paid, and amount of field and office disbursements made by each disbursing officer of the Pay Department, United States Army, during the fiscal year ending June 30, 1897.

Rank and name.	Number of pay trips.	Days consumed.	Number of posts paid.	Miles traveled.						Payments.			Mileage paid to paymasters.	Mileage paid to paymasters' clerks.
				Ambulance.	Stage.	Railroad.	Steamer.	Other conveyance.	Total.	In field.	In office.	Total.		
Colonels and assistant paymasters-general.														
Glenn, Geo. E	2	2	26				88		88	$2,946.90	$649,052.68	$651,999.58	$3.52	$3.52
Canby, J. P *a*											256,578.49	256,578.49		
Candee, Geo. W *b*	1	3	61			718			718	237,860.74	690,165.69	928,026.43	45.87	45.87
Lieutenant-colonels and deputy paymasters-general.														
Carey, A. B	9	9	122				375	14	389	45,072.29	1,571,355.68	1,616,427.97	16.20	16.68
Coxe, F. M	24	33	38			1,336	1,344		2,680	108,098.28	284,888.90	392,987.18	202.75	212.00
Bates, A. E *c*	9	18	28			144	28	99	271	133,654.41	306,290.79	439,945.20	11.81	11.81
Majors and paymasters.														
Wilson, C. I											503,417.54	503,417.54	2.65	2.65
Towar, A. S	2	2	32							11,882.03	451,208.88	462,590.91		
Arthur, Wm	14	14	14			216			216	103,848.09	403,677.58	507,525.67		
Sniffen, C. C	10	12	40	4	7	133	198		342	73,486.91	493,818.56	567,255.47	15.64	16.44
Baird, Geo. W	12	14	54			1,312			1,312	154,786.51	598,716.56	753,503.07	84.48	84.48
Dodge, F. S	32	16	33	19		19			38	192,394.18	395,507.33	587,901.51		
McClure, Chas	13	13	75			10		250	260	75,592.25	908,008.80	983,596.05	11.90	12.50
Witcher, J. S	10	26	63	75		3,275	262		3,612	155,684.89	305,624.49	461,309.38	206.12	59.70
Whipple, C. H	11	11	42					154	154	88,170.23	276,781.09	364,951.32	7.16	7.26
Comegys, W. H	13	31	75	42		1,698	170		1,910	107,377.71	571,412.95	678,790.66	112.81	102.84
Tucker, W. F			62								357,470.30	357,470.30		
Muhlenberg, J. C	12	32	66	154		274	506		934	143,557.80	1,493,540.19	1,637,097.99	37.07	55.61
Smith, Geo. R	22	26	84			362	332		694	159,909.58	879,160.75	1,039,070.33	34.36	35.21
Baker, J. P	9	31	54							162,121.35	72,627.75	234,749.10		
Halford, E. W	5	5	32			100			100	49,758.63	325,773.94	375,532.57	5.80	5.00
Hamner, W. H	4	4	49	36		60			96	263,558.10	170,831.67	434,389.77	4.33	5.19
Kilbourne, C. E	15	21	47	50		1,148	1,344	84	2,626	91,198.80	219,489.87	310,688.67	186.11	179.64
Jackson, A. H *d*			22								159,913.65	159,913.65		39.77
Bullis, J. L *e*											2,089.37	2,089.37		37.16
Wham, J. W *f*														
Total	229	323	1,119	380	7	10,805	4,647	601	16,440	2,360,409.66	12,347,398.50	14,707,808.18	968.58	933.33

a Retired January 7, 1897.
b Promoted colonel January 7, 1897.
c Promoted lieutenant-colonel January 7, 1897.
d Appointed November 17, 1896.
e Appointed February 5, 1897.
f Suspended April 8, 1895.

Statement, by appropriations, of approved and suspended disbursements in paymasters' accounts during the fiscal year ending June 30, 1897, showing also balance of suspensions remaining June 30, 1896, removed during the fiscal year, and the balance remaining June 30, 1897.

Title of appropriations.	Disbursements.			Suspensions.			
	Total.	Approved.	Suspended.	Amount of suspensions on books June 30, 1896	Total suspensions.	Amount of suspensions removed during fiscal year ending June 30, 1897.	Amount of suspensions remaining on books June 30, 1897.
Pay of the Army, 1897	$13,105,145.03	$13,100,192.09	$4,952.94		$4,952.94	$4,362.54	$590.40
Mileage to officers traveling without troops, 1897	110,728.85	110,328.11	400.74		400.74	256.34	144.40
Pay of Military Academy, 1897	274,292.69	274,237.81	54.88		54.88		54.88
Pay of the Army, 1896	722,491.69	722,116.24	375.45	$376.01	751.46	726.59	24.87
Mileage to officers traveling without troops, 1896	11,350.46	11,350.46		30.87	30.87	29.71	1.16
Pay of the Military Academy, 1896	22,450.94	22,450.94					
Pay of the Army, 1895	2,646.18	2,645.05	1.13	206.37	207.50	160.85	46.65
Mileage to officers traveling without troops, 1895				38.39	38.39	8.00	30.39
Pay of the Army, 1894 and prior years				6,730.63	6,730.63	197.45	6,533.18
Bounty to Fifteenth and Sixteenth Missouri Cavalry Volunteers (indefinite)	66.66	66.66					
Extra pay to officers and men who served in the Mexican war (indefinite)	480.00	480.00					
Three months' pay proper (indefinite)	1,534.72	1,534.72					
CERTIFIED CLAIMS.							
Pay of the Army	48.12	48.12					
Pay of two and three years volunteers	1,041.49	1,041.49					
Pay of two and three years volunteers, 1894	232.61	232.61					
Pay of two and three years volunteers, 1895	755.09	755.09					
Pay of two and three years volunteers, 1896	4,896.74	4,896.74					
Pay of two and three years volunteers, 1897	299,162.50	299,162.50					
Bounty to volunteers, their widows and legal heirs	2,148.00	2,148.00					
Bounty to volunteers, their widows and legal heirs, 1894	182.18	182.18					
Bounty to volunteers, their widows and legal heirs, 1895	1,146.84	1,146.84					
Bounty to volunteers, their widows and legal heirs, 1896	4,148.27	4,148.27					
Bounty to volunteers, their widows and legal heirs, 1897	125,114.53	125,114.53					
Bounty under act of July 28, 1866	300.00	300.00					
Bounty under act of July 28, 1866, 1894							
Bounty under act of July 28, 1866, 1895	60.76	60.76					
Bounty under act of July 28, 1866, 1896	835.00	835.00					
Bounty under act of July 28, 1866, 1897	16,548.83	16,548.83					
Total	14,707,808.18	14,702,023.04	5,785.14	7,382.27	13,167.41	5,741.48	7,425.93

Statement showing the balance in the hands of each disbursing officer of the Pay Department, United States Army, on the 1st of July, 1896; the amount remitted to each from the United States Treasury, or turned over by other agents during the fiscal year ending June 30, 1897; the amounts accounted for by accounts and vouchers of expenditures, or by transfer or replacement in the Treasury, and the balance remaining in the hands of paymasters to be accounted for in the next fiscal year.

Rank and name.	Balance in hands of each paymaster on June 30, 1896.	Remitted from the Treasury in the year ending June 30, 1897.	Received from other paymasters.	Received from soldiers' deposits.	Received from paymasters' collections.	Total received and to be accounted for.	Surplus funds deposited in the Treasury.	Paymasters' collections deposited in the Treasury.	Expenditures.	Transferred to other paymasters.	Balance in hands of each paymaster on June 30, 1897.	Total accounted for.
Colonels and assistant paymasters-general.												
Glenn, George E	$56,247.04	$1,381,000.00	$181,980.90	$12,694.19	$1,862.87	$1,633,785.00	$15,025.52	$1,862.87	$651,999.58	$917,972.89	$46,924.14	$1,633,785.00
Canby, James P. *a*	34,974.49	307,000.00	40,800.00	6,122.20	3,542.23	392,438.92	12,000.00	3,542.23	256,578.49	120,318.20	.....	392,438.92
Candee, George W. *b*	31,612.30	893,000.00	283,120.62	25,535.64	9,947.12	1,243,215.68	1,556.01	9,947.12	928,026.43	292,711.38	10,974.74	1,243,215.68
Lieutenant-colonels and deputy paymasters-general.												
Carey, A. B	117,975.86	3,119,000.00	41,507.57	38,261.99	8,154.09	3,324,899.51	22,000.00	8,154.09	1,616,427.97	1,666,087.55	12,229.90	3,324,899.51
Coxe, F. M	13,561.62	656,000.00	27,350.38	15,188.51	2,846.42	714,946.93	2,407.38	2,846.42	392,987.18	270,617.07	46,088.88	714,946.93
Bates, A. E. *c*	56,673.47	575,000.00	73,636.08	8,954.47	6,026.98	720,291.00	17,725.96	6,026.98	439,945.20	233,110.48	23,482.38	720,291.00
Majors and paymasters.												
Wilson, C. I	66,809.82	524,690.36	42,150.91	350.00	922.15	634,923.24	7,625.55	922.15	503,417.54	33,220.41	89,737.59	634,923.24
Towar, A. S	.....	725,000.00	86,402.50	30,668.68	7,254.91	849,326.09	15,965.07	7,254.91	462,590.91	349,170.58	14,344.62	849,326.09
Arthur, Wm	29,291.18	330,000.00	150,012.00	20,100.10	7,055.93	536,459.21	.....	7,055.93	507,525.67	8,132.79	13,744.82	536,459.21
Sniffen, C. C	.....	337,000.00	359,036.09	19,955.26	7,243.57	723,234.92	19.12	7,243.57	567,255.47	106,719.20	41,997.56	723,234.92
Baird, G. W	61,979.10	687,000.00	82,594.32	36,261.41	17,348.65	885,183.48	1,465.00	17,348.65	753,503.07	112,866.76	.....	885,183.48
Dodge, F. S	34,233.33	736,000.00	41,648.02	23,912.00	7,326.27	843,119.62	.....	7,326.27	587,901.51	238,516.29	9,375.55	843,119.62
McClure, Chas	40,802.92	873,000.00	215,875.63	34,878.67	18,612.18	1,183,169.40	3,850.00	18,612.18	983,596.05	169,264.58	7,846.59	1,183,169.40
Witcher, J. S	3,277.41	280,000.00	233,230.87	23,242.25	4,480.96	544,231.49	1,830.67	4,480.96	461,309.38	56,940.43	19,670.05	544,231.49
Whipple, C. H	15,333.66	82,000.00	369,147.13	22,894.90	9,102.70	498,478.39	713.78	9,102.70	364,951.32	96,094.04	27,616.55	498,478.39
Comegys, W. H	78,882.58	190,000.00	534,221.10	30,562.09	12,645.81	846,311.58	.....	12,645.81	678,790.66	126,746.36	28,128.75	846,311.58
Tucker, W. F	6,518.65	.....	354,150.00	30,883.07	8,467.92	400,019.64	.....	8,467.92	357,470.30	31,242.88	2,838.54	400,019.64
Muhlenberg, J. C	95,655.57	1,713,000.00	76,905.04	13,113.38	10,125.20	1,908,799.19	20,442.39	10,125.20	1,637,097.99	188,299.29	52,834.32	1,908,799.19
Smith, G. R	75,758.96	.....	1,010,000.00	23,632.89	12,852.97	1,122,244.82	345.08	12,852.97	1,039,070.33	.....	69,976.44	1,122,244.82
Baker, J. P	.....	.....	276,305.39	13,915.13	3,682.64	293,903.16	.....	3,682.64	234,749.10	36,901.47	18,569.95	293,903.16
Halford, E. W	37,987.81	287,000.00	102,649.70	27,414.68	6,726.73	461,778.92	5,353.47	6,726.73	375,532.57	68,687.56	5,478.59	461,778.92
Hamner, W. H	47,387.81	135,000.00	219,773.98	36,783.99	10,248.24	479,194.02	3,146.99	10,248.24	434,389.77	31,409.02	.....	479,194.02

Kilbourne, C. E.	31,836.70	35,000.00	265,000.00	24,369.06	5,789.36	361,995.12	2,719.82	5,789.36	310,688.67	5,000.00	37,797.27	361,995.12
Jackson, A. H. *d*		103,000.00	52,971.70	15,698.08	2,658.62	174,328.40		2,658.62	159,913.65	46.50	11,709.63	174,328.40
Bullis, J. L. *e*			6,605.80		12.25	6,618.05		12.25	2,089.37		4,516.43	6,618.05
Wham, J. W. *f*												
Acting paymaster.												
Maus, M. P. *g*			3,000.00			3,000.00					3,000.00	3,000.00
Total	936,800.28	13,968,690.36	5,160,075.73	535,392.64	184,936.77	20,785,895.78	134,191.81	184,936.77	14,707,808.18	5,160,075.73	598,883.29	20,785,895.78

a Retired January 7, 1897.
b Promoted colonel January 7, 1897.
c Promoted lieutenant-colonel January 7, 1897.
d Appointed November, 1896.
e Appointed February 5, 1897.
f Suspended April 8, 1895.
g On foreign service.

Statement of the account of the Pay Department, United States Army, with the

Appropriations.	In account with the Treasury.				
	Balance in the Treasury July 1, 1896.	Amount of appropriations and transfer warrants.	Unexpended balances deposited.	Paymasters' collections deposited.	Repayments in settlement of accounts.
Pay, etc., of the Army, 1897	.....	$12,963,512.73	.....	$99,749.25	$52.59
Pay of Military Academy, 1897	.....	303,482.61	.....	.....	.....
Mileage to officers traveling without troops, 1897	.....	140,000.00	.....	267.97	553.28
Pay, etc., of the Army, 1896	$24,082.86	.....	$125,008.76	7,489.20	147.47
Pay of Military Academy, 1896	14,796.47	.....	810.60	.....	.....
Mileage to officers traveling without troops, 1896	27,627.41	.....	442.39	65.29	447.92
Pay, etc., of the Army, 1895	2,577.46	.....	304.51	1,078.38	2.36
Pay of Military Academy, 1895	7,349.27	.....	.....	.....	.....
Mileage to officers traveling without troops, 1895	1,295.56	.....	.....	.....	.....
Pay, etc., of the Army, 1894 and prior years	.....	.....	3,544.73	1,228.63	78.60
Pay of two and three year volunteers, 1871 and prior years	.....	.....	.....	.....	156.38
Bounty to Fifteenth and Sixteenth Missouri Cavalry Volunteers	.....	66.66	.....	.....	.....
Extra pay to officers and men who served in Mexican war	.....	980.00	.....	.....	.....
Three months' pay, proper	.....	2,191.10	.....	.....	.....
CERTIFIED CLAIMS.					
Pay, etc., of the Army	738.95	.....	.....	.....	.....
Pay of two and three year volunteers	4,704.05	.....	.....	.....	.....
Pay of two and three year volunteers, 1894 and prior years	.....	.....	2,416.61	.....	2.36
Pay of two and three year volunteers, 1895	.....	.....	.....	.....	.....
Pay of two and three year volunteers, 1896	4,979.42	.....	.....	7.57	.....
Pay of two and three year volunteers, 1897	.....	300,000.00	.....	.....	3.61
Bounty to volunteers, their widows and legal heirs	16,812.81	.....	.....	.....	.....
Bounty to volunteers, their widows and legal heirs, 1894 and prior years	.....	.....	1,739.21	.....	99.70
Bounty to volunteers, their widows and legal heirs, 1895	.....	.....	.....	.....	.....
Bounty to volunteers, their widows and legal heirs, 1896	39,975.00	.....	.....	20.00	276.66
Bounty to volunteers, their widows and legal heirs, 1897	.....	190,000.00	.....	.....	75.00
Bounty under act of July 28, 1866	2,097.45	.....	.....	.....	.....
Bounty under act of July 28, 1866, 1894 and prior years	.....	.....	896.45	.....	.....
Bounty under act of July 28, 1866, 1895	.....	.....	.....	.....	.....
Bounty under act of July 28, 1866, 1896	.....	.....	.....	.....	.....
Bounty under act of July 28, 1866, 1897	.....	22,000.00	.....	.....	.....
Traveling expenses of California and Nevada volunteers	187.21	.....	.....	.....	.....
TRANSFER ACCOUNT.					
Pay, etc., of the Army, 1894 and prior years	.....	13.00	.....	.....	.....
Total	147,223.92	13,922,246.10	135,163.26	109,906.29	1,895.93

appropriations subject to its control during the fiscal year ending June 30, 1897.

In account with the Treasury.							
Total.	Amount drawn by requisition.		Amount covered into surplus fund.	Total.	Balance in the Treasury June 30, 1897.	Balance in the hands of paymasters June 30, 1897.	Total balances June 30, 1897.
	On Pay Department request.	On Treasury settlements.					
$13,063,314.57	$13,044,700.00	$65.38	.....	$13,044,765.38	$18,549.19	$474,900.72	$493,449.91
303,482.61	302,000.00	.....	.....	302,000.00	1,482.61	27,707.31	29,189.92
140,821.25	117,300.00	252.42	.....	117,552.42	23,268.83	6,571.15	29,839.98
156,728.29	12,000.00	284.96	.....	12,284.96	144,443.33	7,289.60	151,732.93
15,607.07	.....	.....	.....	.....	15,607.07	.....	15,607.07
28,583.01	3,000.00	367.18	.....	3,367.18	25,215.83	.....	25,215.83
3,962.71	1,000.00	32.80	$2,929.91	3,962.71	.....	2,178.25	2,178.25
7,349.27	.....	.....	7,349.27	7,349.27	.....	.....	.....
1,295.56	.....	30.39	1,265.17	1,295.56	.....	.....	.....
4,851.96	.....	.....	4,851.96	4,851.96	.....	.....	.....
156.38	.....	.....	156.38	156.38	.....	.....	.....
66.66	66.66	.....	.....	66.66	.....	.....	.....
980.00	980.00	.....	.....	980.00	.....	500.00	500.00
2,191.10	2,191.10	.....	.....	2,191.10	.....	656.38	656.38
738.95	.....	.....	.....	.....	738.95	2,529.93	3,268.88
4,704.05	.....	.....	.....	.....	4,704.05	4,872.84	9,576.89
2,418.97	.....	.....	2,418.97	2,418.97	.....	.....	.....
.....	.....	.....	.....	.....	.....	197.72	197.72
4,986.99	4,000.00	.....	.....	4,000.00	986.99	4,997.19	5,984.18
300,003.61	299,162.60	841.01	.....	300,003.61	.....	.10	.10
16,812.81	290.00	.....	.....	290.00	16,522.81	6,582.08	23,104.89
1,838.91	.....	.....	1,838.91	1,838.91	.....	.....	.....
.....	.....	.....	.....	.....	.....	978.57	978.57
40,271.66	.....	.....	.....	.....	40,271.66	10,416.44	50,688.10
190,075.00	160,000.00	.....	.....	160,000.00	30,075.00	34,885.47	64,960.47
2,097.45	.....	.....	.....	.....	2,097.45	1,666.66	3,764.11
896.45	.....	.....	896.45	896.45	.....	.....	.....
.....	.....	.....	.....	.....	.....	897.41	897.41
.....	.....	.....	.....	.....	.....	5,604.30	5,604.30
22,000.00	22,000.00	.....	.....	22,000.00	.....	5,451.17	5,451.17
187.21	.....	.....	.....	.....	187.21	.....	187.21
13.00	.....	13.00	.....	13.00	.....	.....	.....
14,316,435.50	13,968,690.36	1,887.14	21,707.02	13,992,284.52	324,150.98	598,883.29	923,034.27

REPORT OF THE CHIEF SIGNAL OFFICER.

REPORT

OF

THE CHIEF SIGNAL OFFICER.

WAR DEPARTMENT, SIGNAL OFFICE,
Washington, September 30, 1897.

SIR: I have the honor to submit the following report on the Signal Corps of the Army for the fiscal year ending June 30, 1897:

MILITARY TELEGRAPH LINES.

The permanent military telegraph lines operated by the Signal Corps, aggregating 802 miles in length, exclusive of eight-tenths of a mile cable in the harbor of New York, remained during the year under the charge of Maj. Robert Craig, Signal Corps, assistant, whose tabular statement (No. 1) as to the location and length of said lines is hereto annexed. These lines, mainly situated in mountainous and desert regions, have been maintained in excellent condition during the year, through the energetic and judicious supervision of the officers of the Signal Corps.

The most important additions during the past year have been in connection with the operations against hostile Indians in Arizona. Through the instrumentality of these new lines, hostile Indians, either invading the United States from Mexico, or in attempting to escape southward from the San Carlos Indian Agency, can now be speedily intercepted. The northern line, 42 miles in length, extends from Fort Grant through Cedar Springs to Mammoth, Ariz., while the southern line on the Mexican frontier, also 42 miles long, extends from Bisbee to San Bernardino, Ariz. The latter line, in addition to its military usefulness, has been very valuable to the officials of the United States Treasury Department, who have been furnished telephonic facilities between the custom-houses from Bisbee to San Bernardino.

In New York Harbor, telephonic and telegraphic communication has been established between Headquarters Department of the East, at Governors Island, to New York City and to Ellis Island, the cable being laid in cooperation with the Bureau of Immigration of the Treasury Department.

The several military divisions have been in charge of the signal officers of the military departments, viz, Capt. Richard E. Thompson, Signal Corps, Department of Dakota; Capt. William A. Glassford, Signal Corps, Department of the Colorado; First Lieut. Frank Greene, Signal Corps, Department of California, and First Lieut. Samuel Reber, Signal Corps, Department of Texas.

In the post commanders is vested, under the general supervision of the signal officer of the Department, the administration of the following short military lines connecting posts with the commercial systems, on which lines no tolls for the transmission of messages are collected: Fort Clark to Spofford Junction, Tex.; Fort Reno to Elreno, Okla.; Fort Sill, Okla., to Rush Springs, Ind. T.; Fort Bayard to Silver City, N. Mex.; Fort Custer to Custer Railroad Station, Mont.; Fort Niobrara to Valentine, Nebr.; Fort Wingate to Wingate Station, N. Mex.; Fort Huachuca to Huachuca Siding, Ariz.; Fort Bliss to El Paso, Tex., and Fort Washakie to Lander, Wyo.

While the permanent telegraph lines were constructed for military purposes, yet they largely subserve commercial interests. The extremely low charge for messages, less than 2 cents per word, necessarily limits the revenue; nevertheless the receipts on account of Government tolls amounted to over 12 per cent of the appropriations for the operations of the Signal Corps. The sum of $2,244.90 was collected for the transmission of messages and covered into the United States Treasury. The number of messages transmitted on lines handling paid commercial messages, on Government, State, and other business, aggregated 56,097. The tariffs of messages handled, including Government business, aggregated $10,797.03, and official business done on lines where no charges are made must have amounted to several thousand dollars in addition.

The Wilcox-Holbrook line is almost indispensable to the commercial interests of central Arizona, affording the only telegraphic outlet for the extensive Globe mining district. The same may be said of the Fort Brown-Fort McIntosh line on the Rio Grande, it being the only means for immediate communication with the outside world for a distance of 200 miles along the Mexican frontier.

To insure speedy communication in case of emergency, all important posts should be connected with the commercial system either telephonically or telegraphically. Where such means of communication do not exist they should be speedily constructed for emergencies, especially between Fort Washington, Md., and Washington, D. C.; Fort Warren and Boston, Mass.; Alcatraz Island and San Francisco, Cal.; Fort Slocum and New York City.

The importance of military lines is very great, whether viewed from a military or local standpoint. They increase the efficiency and subserve the economical interests of the Government, and are of inestimable value to commercial interests. As a means of speedy intercommunication, these lines enable commanding generals to keep themselves promptly informed of the conditions and prospective disturbances on the great Indian reservations and along the Mexican frontier. The military telegraph lines connecting Fort Du Chesne, Utah, and the San Carlos Indian Reservation with the commercial systems are absolutely necessary for the proper control of the semihostile Indians of these agencies. The deterrent effect of these lines upon the Indians, as to acts of violence, has a value that can not be overestimated, involving as it does human life and the safety of adjacent settlers. The Indians now realize that through telegraphic information outbreaks and violence are followed by speedy action of the military authorities.

Interruption to telegraphic communication has been most infrequent during the year. The most frequent cause of interruption has been through lawlessness of individuals in pulling down poles, shooting off insulators, etc. The speedy resumption of communication has been due to a great extent to the adoption of the bicycle as a means of

transportation for repairmen, the more rapid as well as more economical method of travel. Frequently breaks on a line have been repaired by the use of the bicycle in less time than would have been consumed in obtaining a horse and vehicle. At some stations in a year the original value of the bicycle has been saved to the Government. Different types of bicycles have been selected for experimental test with a view to the fact that they must carry heavy loads over rough ground at moderate speed. It is evident that no single type will fulfill all the requirements of a military wheel everywhere, owing to different climatic conditions and varying road conditions.

The principal military lines are now fully equipped with testing boxes. On the Rio Grande it was found necessary to substitute bullet-proof boxes.

Military stations are as a rule in charge of sergeants of the Signal Corps. The great demand for signal sergeants, however, and the limited number available makes it necessary to employ a few civilian operators at points, as indicated in Table 1. It is a source of great gratification to the Chief Signal Officer to state that in the collection, transmission, and accounting of the line receipts not a cent has been lost during the year. These moneys come into the hands of the sergeants in small amounts, and at isolated stations the sum necessarily aggregates a considerable amount before the money can be transmitted to the officer in charge. The fidelity of the sergeants thus charged with onerous responsibilities indicates the high moral standing of the enlisted men of the Signal Corps, which is recruited from such noncommissioned officers of the line of the Army as through educational examinations, surgeons' certificates of physical fitness, and testimonials of moral character from their immediate commanding officers appear to be best qualified for the Signal Corps.

FLYING TELEGRAPH LINES.

The importance of electrical communications in modern warfare emphasizes the necessity of perfecting methods therefor to the highest degree of efficiency. Special attention is given by the Signal Corps to the suitable equipment of its flying telegraph trains in all phases, from the connection of army headquarters with the permanent commercial lines to the provision for temporary telegraphic or telephonic intercommunication between separate military commands, whether in camp or on the skirmish lines.

Field or flying telegraphy, initiated by the United States during the war for the Union, keeps pace in its development with the astonishing advances of electrical science. Other nations have gradually adopted American methods, which are now practiced by France, Germany, Great Britain, Italy, and even Japan, in maneuvers and in war.

Efforts have been continued with a view of obtaining in each flying train of the Signal Corps maxima of efficiency and of line length with minima of transportation and labor.

Continued experiments in field telephony and telegraphy have been carried on by Captain Allen and Lieutenants Maxfield, Greene, and Reber, of this corps, who have in their respective military departments remodeled the flying telegraph train usually carrying 15 miles of poles and wire. After correction of defects which may develop in trial of these trains, they will be available as models for the future.

The most notable advance is in the development of the combined telegraph and telephone apparatus devised by Capt. James Allen,

Signal Corps, which is distinctly superior to any previously constructed, and admirably answers all requirements. An operator can easily carry a combination telegraph and telephone office, and while one soldier telegraphs a message, another may, over the same wire, talk telephonically with another station, the distant receiving operators hearing only their own message. The outfit weighs but 16 pounds, including battery, and has been rigidly tested up to a distance of more than 600 miles, and is a pronounced success in its various capacities as a "buzz," Morse, telephonic, and phonoplex instrument. The importance of this means of communication is not confined to the field work of the Signal Corps, but in its many applications may well become world wide. Its practical value on cables entirely disabled has been demonstrated on the military cable between Angel Island and Tiburon, Cal. By attaching one of these instruments to either end of the cable, which was rendered entirely useless for the transmission of messages by ordinary methods nearly two years ago, it has been most successfully used for intercommunication between those places, without a single interruption, during the past year. This thorough test and practical use of the instrument sufficiently demonstrate its value. Improvements have been made by Captain Allen by providing an automatic cut-out for the battery when not actually in use in the transmission of a message, and further improvement in the apparatus is hardly expected.

POST TELEGRAPH AND TELEPHONE LINES.

Every post thus desiring has been supplied with telegraph instruments and materials for practice lines. Beyond the primary purpose of stimulating an active interest in military signaling these lines have inured to the benefit of many men who have thus acquired telegraphic experience. Military posts have also been furnished with telephones and wire for establishing electrical intercommunication on target ranges, thus facilitating practice and insuring safety. The more important artillery ranges are equipped with the sling psychrometer, an automatic anemometric register, and either a compensated aneroid or a standard mercurial barometer.

At Fort Leavenworth, Kans., has been erected a telephonic exchange on conditions approximating those of actual field service. This materially facilitates administration and familiarizes student officers with modern methods of telephonic and electrical intercommunication.

MILITARY SIGNALING.

The Army Regulations require that constant instruction be maintained until at least one officer and four enlisted men of each company are proficient in the exchange of both day and night signals. The present system, in operation since 1885, has received the unremitting attention of the Chief Signal Officer to make it a success. Experiences of these twelve years emphasize the fact that facilities and incentives are wanting for the development of skilled signalists in the line of the Army. Moreover, experience has demonstrated that in extended field operations recourse is had to the Signal Corps. In the Geronimo campaign, 1886; in the Wounded Knee campaign, 1890; in Chicago in 1894, and during military operations along the disturbed Mexican border in 1893 the system entirely failed, and recourse was necessarily had to the few signal sergeants, who were assembled from long distances, at great expense and with loss of time.

The tabulated statement in signaling (Table 2) indicates the number of officers and enlisted men proficient on June 30, 1897. It will be seen that the cavalry report as proficient but 47 per cent of officers and 40 per cent of the number of enlisted men called for by Army Regulations. In the artillery 60 per cent of officers and 77 per cent of the required number of men are proficient. In the entire Army there are proficient 41 and 48 per cent of officers and enlisted men, respectively. The Eighth Cavalry does not report either an officer or enlisted man proficient, and the Fifth Cavalry has but 2 officers and 8 men. In the artillery 36 of the 60 batteries report no officer proficient, and 23 batteries have not an enlisted man proficient. In the cavalry 56 troops have no proficient officer, and 55 have no man proficient. In the infantry 143 companies are without an officer proficient, while 115 companies are without a man proficient. In the Fourth, Fifth, Sixth, Fourteenth, Twenty-first, Twenty-second, and Twenty-fourth Infantry there is neither an officer nor an enlisted man proficient. The Third Infantry has only 1 officer and no enlisted man proficient.

That conscientious effort has been made to attain proficiency required by Army Regulations is admitted, yet this year's work should be finally convincing of the inutility of the necessarily desultory practice of signaling under the system of having one officer and four enlisted men from each organization, company, troop, or battery under instruction, which has heretofore obtained in all the military departments. To expect efficient, reliable work from men trained in the cavalry, artillery, or infantry arm of the service, if called upon for duty in other than their own special line, would be much more reasonable than to expect that either of these arms can satisfactorily perform the especially technical work which falls to the Signal Corps. Appreciating these conditions, and having in mind the large number of officers and enlisted men who were called from their more legitimate duties for the practice of signaling, the Chief Signal Officer recommended an experimental and radical departure. This scheme, approved by the Major-General Commanding the Army and the Secretary of War, called for the detail of two men from each of the garrisoned posts in the Department of the Colorado, and on May 7, 1897, the necessary orders were issued by the commanding general of the Department of the Colorado for the assembling at Fort Logan, Colo., of 18 enlisted men.

Aside from the most important consideration, the increased efficiency of this detail in signaling, the economy of the scheme is worthy of attention. In the Department of the Colorado at the time the detail was made, there were 49 organizations. Under the system of post practice, as a minimum number, 49 officers and 196 enlisted men would attend signal instruction, and with comparable results most unfavorable to those accomplished in a few months by the detailed force of 18 men at Fort Logan. In that department alone, then, 49 officers and 178 enlisted men have been relieved of an irksome and extraneous duty, and the department will have at its call a skilled signal detachment. The instant success of this departure suggested a like course in other military departments, and, with the approval of the Major-General Commanding and the Secretary of War, a detail of two men from each post was assembled in the Department of Texas at Fort Sam Houston, Tex., for instruction under the supervision of the department signal officer.

It is suggested that the best results can at present be secured with the greatest economy of force by having detailed for the Department of the East 30 men, the Missouri 20 men, the Colorado 20 men (now

18 there), California 15 men, Dakota 15 men, and Texas 15 men (now 14 there). In each of these departments an officer of the Signal Corps is on duty, and the thorough instruction of these men should be under his supervision. The Army would then have geographically well located a small detachment ready for expert service whenever and wherever required. The necessity of having in readiness specialists for establishing and maintaining communication between the different military commands has been fully demonstrated by past experiences. Harmonious unification of action of his army, many times multiplied powers of vision and hearing, are advantages which the skilled signalist gives to the commander, and these, surely, count for much. In the war of the rebellion the Signal Corps of the Federal Army, with little or no experience, with crude appliances, and with instruments devised in present necessities, gave incontrovertible evidence of its great worth, and in future conflicts a signal corps trained to expertness in every duty which may properly fall to it will be indispensable. Foreign powers, quick to recognize the value of such a corps, have formed, equipped, and trained them, until now, except in zeal and desire to improve, we have been outstripped by many of them. The scheme suggested will provide, at least, the nucleus of such a corps, and will do it not only without additional expense over former methods, but with an economy to the Government of 87 per cent. The 115 men whom it is suggested be detailed for signal instruction will be available for duty in any of the military departments should occasion require. Under the system of department detail constant practice with the flag, heliograph, torch, and lantern at increasing ranges would be had and practical instruction given in the erection and operation, maintenance and dismantling of flying and semipermanent telegraph lines, in the working of outpost cable, connecting and operating the combined telegraph and telephone apparatus in field operations, and, where practicable, in military captive ballooning. In a word, the 115 men would be made expert signalmen, and they would relieve from practice at the posts 360 officers and 1,140 enlisted men whom Army Regulations require to be proficient in signaling.

FIELD OPERATIONS.

But little opportunity was afforded for signal work in the field during the year. The signal officers at Forts Adams, Alcatraz, Angel Island, Apache, Assiniboine, Barrancas, Benicia Barracks, Bliss, Brown, Canby, Columbus Barracks, Custer, Ethan Allen, Hamilton, Harrison, Jefferson Barracks, Key West Barracks, Leavenworth, McHenry, McIntosh, Mason, Missoula, Monroe, Niobrara, Preble, Presidio of San Francisco, Riley, Ringgold, Robinson, St. Francis Barracks, San Diego Barracks, Schuyler, Slocum, Spokane, Trumbull, Warren, Washakie, Willets Point, and Wingate report that practical use was made of signals during the year at artillery practice, by scouting parties, during field maneuvers, and in vessel-tracking drill, etc.

MILITARY BALLOONS.

The addition of a balloon section to field telegraph trains for the purpose of collecting and transmitting military information brings into special importance the question of aerial navigation. As regards balloons, continued experiments have brought the use of a captive balloon to such a degree of excellence that its utility in warfare is evident.

The efforts to construct a dirigible balloon whose movements are under satisfactory control have so far been inconclusive. There is no question that private inventors have constructed balloons which have actually been propelled in any desired direction, but only at low speed in light winds.

A satisfactory war balloon must carry three or four passengers, explosive shells, a machine gun or two, be able to travel 30 miles an hour in calm weather, and have a lifting capacity of about 5,500 pounds, of which 1,700 should be in passengers, instruments, explosives, and ballast. The French military dirigible balloon, known as the Challais-Meudon, was successful at low speed and in calm weather, but it was only able to carry 310 pounds of passengers and 470 pounds of ballast.

Many methods, most of them Quixotic, have been presented to this office for aerial navigation. It is believed that the success of such navigation awaits a motor considerably lighter than those now used. Professor Langley, in flights with his aeroplane, indicates that the solution of this interesting and important problem is not far distant. Meanwhile the Chief Signal Officer has taken such action to place on an efficient footing a model captive balloon section, suitable as a part of the field train, as facilities and appropriations have permitted. This work has progressed at Fort Logan, Colo., under the supervision of Capt. W. A. Glassford, Signal Corps, who has now at that post a silk balloon of 14,000 cubic feet capacity; a balloon wagon with cable drum, captive cables, and accessories; one service wagon; a gas-generating apparatus; a compressor for impounding gas in tubes, and 180 steel tubes, in which gas is compressed to $\frac{1}{100}$ or $\frac{1}{120}$ of its volume. A balloon house, essential for economical practice, has been constructed at Fort Logan, and permits of ascensions in all weathers.

A special estimate of $10,000 is submitted for construction and experiments with balloons, and it is hoped it may meet the approval of the Secretary of War and of Congress.

NATIONAL MILITIA.

Never before has nearly so great an interest been taken in signaling by the National Guard as at present. During the year there has been a very large increase in the number of communications requesting information, asking for code cards, and requesting general information on signaling matters. In many instances the writers ask that they be permitted to purchase instruments from their allotment of the funds appropriated by Congress for their support. In this connection it is urgently recommended that the law be amended to permit of the issue, by sale, of signaling appliances to the National Guard under conditions which now apply to quartermaster and ordnance stores.

The signal corps of the National Guard of Connecticut, New York, Illinois, and Ohio have been active during the year, and the Connecticut corps, under command of Maj. Howard A. Giddings, has, in addition to skillful signaling during the encampment of the National Guard of that State, prepared an excellent signal map of the eastern entrances to Long Island Sound, which in case of war would be most valuable. The proficiency of this corps is commended, and its record is a guaranty that whatever work it undertakes will be well performed.

COLLEGES.

An enlarged interest in the art of military signaling has been evidenced at the educational institutions of the country, and with the approval of the Chief Signal Officer the following-named colleges have been enabled to give a course of instruction and practice by issuing code cards, instructions, practice wands, and flags to the Army officers detailed thereat:

Alabama: Alabama Agricultural and Mechanical College; University of Alabama.
Arkansas: Arkansas Industrial University.
California: University of California.
Delaware: Delaware College.
Florida: Florida Agricultural College.
Georgia: North Georgia Agricultural College.
Illinois: Knox College; Western Military Academy.
Indiana: De Pauw University.
Iowa: Cornell College; Iowa State Normal School.
Kansas: State Agricultural College; Baker University.
Kentucky: Agricultural and Mechanical College of Kentucky.
Maine: The University of Maine.
Maryland: Maryland Agricultural College.
Massachusetts: Massachusetts Agricultural College.
Michigan: Michigan Military Academy; Michigan Agricultural College.
Minnesota: University of Minnesota.
Missouri: St. Louis University.
New York: Cornell University; St. John's College; St. John's Military School; New York Military Academy; Clinton Liberal Institute; College of St. Francis Xavier; Riverside Academy.
North Dakota: University of North Dakota.
Ohio: Ohio State University; Ohio Military Institute.
Pennsylvania: The Pennsylvania State College; Pennsylvania Military College; Grove City College; Girard College; Franklin and Marshall College.
Rhode Island: Brown University.
South Carolina: South Carolina Military Academy; Clemson Agricultural College.
Tennessee: University of Tennessee.
Texas: Agricultural and Mechanical College of Texas; Baylor University.
Vermont: Norwich University.
Virginia: Virginia Agricultural and Mechanical College; Virginia Military Institute; Danville Military Institute.
West Virginia: West Virginia University.
Wisconsin: State University of Wisconsin.
Wyoming: University of Wyoming.

Many of these students, after completing their studies, attach themselves to the National Guard and the instruction in signaling which they have received lends additional value to their services. On more than one occasion they have been called upon for actual duty in the field with the National Guard engaged in the suppression of mobs, etc.

The heliograph instructions, prepared with a view to meeting the wants of the Army, of colleges and the National Guard in visual signaling, are attached to this report as Table 4.

MILITARY CABLE LINES.

The compound system of telegraph lines—land lines and submarine cables—in San Francisco Harbor has disappeared through the action of time and of accident, leaving its important fortifications unconnected electrically. The Chief Signal Officer has repeatedly called attention to the great military value of this system and to the impracticability of renewing it without special appropriation. If San Francisco is of sufficient importance to justify its defense by costly and extensive fortifications, it is equally imperative that means for electrical intercommunication should be provided, so that when occasion requires, the entire system of defense can be controlled and directed by one master

mind. Similar systems of intercommuication should be established in the harbors of New York and Boston, where, however, the commercial telegraph systems, certain to be interrupted in time of war, present much greater convenience for prompt military administration than is afforded at San Francisco. For these purposes a special estimate of $20,000 is submitted, and its approval is again urgently recommended.

SIGNAL EQUIPMENTS.

Signal equipments have been steadily improved, except appliances for night signaling, a problem of great difficulty. The many factors involved, i. e., weight, portability, compactness, penetrating power of the light, liability to accident and ease of repair, etc., make what appears to be an easy task one of great difficulty. All of the leading lantern manufacturers in this country have been communicated with, and models of the lanterns used for signaling purposes in foreign armies obtained, but none reach the high standard decided upon for this corps. It is probable, however, that a model lantern will be decided upon during the present year and a supply secured. A torch for which much was claimed has received practical test under direction of this office, but it fell far below the torch in use by this corps. Until a lantern entirely superior to the torch is invented, the latter will be relied upon for visual night signaling where electrical appliances are not available.

PERSONNEL OF THE CORPS.

The personnel of the officers of the Signal Corps remains unchanged Under the act of Congress approved March 2, 1896, the grade of lieutenant-colonel was opened to immediate promotion. Lieut. Col. H. H. C. Dunwoody, who has performed no military duty with his corps for six years, remains on detached civil duty in charge of forecast work of the Weather Bureau. At the end of the fiscal year other officers were serving as follows: Maj. Robert Craig, disbursing officer and assistant; Capts. James Allen, R. E. Thompson, W. A. Glassford; First Lieuts. J. E. Maxfield, Frank Greene, and Samuel Reber, signal officers of the departments, and Capt. George P. Scriven, with the Bureau of Military Information as military attaché at Rome, Italy.

Eight sergeants were reenlisted during the year and one died.

The clerical force of this office has labored with unusual fidelity and zeal. Both of the clerks of class 1 merit increased pay, owing to the character of the work done by them, as promotion is practically impossible.

DISBURSING DIVISION.

The report of Maj. Robert Craig as disbursing officer (Table 3) furnishes information required by law and regulations as to appropriations and disbursements. Besides his duties as assistant and disbursing officer, Major Craig has charge of the supply depot of the Signal Corps, which imposes on him much extra work. His labors have been supplemented by those of a storekeeper and assistant, who are diverted from special duties to an extent prejudicial to the public service. A money clerk is greatly needed for the disbursing officer, and there is submitted an estimate for a clerk of class 2, which it is hoped will be favorably considered by Congress.

The money value of requisitions filled for post signal officers during the year was $6,310.71, and of requisitions for signal officers of the military departments, $7,329.16.

EXAMINATION OF MONEY AND PROPERTY PAPERS.

There have been examined and passed upon 174 accounts current, with 4,481 vouchers; 417 property returns of signal officers, and 69 property returns of officers and sergeants of the Signal Corps, with 2,999 vouchers. At the end of the fiscal year 18 property returns were unsettled, owing to unadjusted errors. On the accuracy and thoroughness of this work devolves the final adjudication of the Signal Corps property, accountability of officers of the Army, sergeants of the Signal Corps, and civilian employees. All money accounts, whether for funds appropriated by Congress or received as tolls for messages over military telegraph lines, have been carefully examined, and any errors found therein adjusted prior to their transmission to the Auditor of the War Department. This work involves a large amount of correspondence, and only by the closest application have the money accounts and property returns received the administrative scrutiny of this Bureau within the legal limit of time.

WAR DEPARTMENT LIBRARY.

In obedience to special orders of the Secretary of War, the Chief Signal Officer, in addition to his usual duties, has exercised a supervisory charge over the War Department library.

Exclusive of the public documents and Government publications there were added to the library during the year 1,274 books and pamphlets and about 1,000 periodicals. Of the books, 650 were acquired by purchase, 270 by exchange, and 354 by gift. Those purchased, either for professional research or reference, include publications on war and allied sciences. Special attention is given to the collection of historical works on American wars, and the books contributed as gifts are largely those relating thereto. Particular attention is given to works bearing on the resources and political conditions of countries which are engaged in warfare, or where such contests are anticipated, so that officers of our Army may intelligently follow current military operations.

The library has been very successful in exchanges, as authorized by the law of January 12, 1895. In exchange for military publications of the War Department this library has received during the past year no less than 34 separate military periodicals from foreign countries. In accordance with the authority of the Secretary of War, nearly 2,000 volumes of nonmilitary fiction have been distributed pro rata to military posts most in need of such literature—a proper distribution, as the books were purchased from the army contingent fund. The only fiction now in this library relates entirely to military subjects.

Particular efforts have been made to obtain books and pamphlets relating to American wars, especially those relating to the war for the Union. A large number of pamphlets and books have been donated to the library in answer to widely distributed circular letters. Gradually the breaks and deficiencies in important military serial publications are being filled by purchase or exchange.

The regulations extending the use of the library to officers of the Army on duty at distant posts have had gratifying results. No book has been lost and none materially damaged. The professional value of this privilege to officers is indicated by the fact that 550 books were loaned by registered mail during the fiscal year. The professional activity of the officers is strongly evidenced from the character of the publications borrowed, which very largely pertain to the higher branches of scientific and military literature. In addition, 3,523 volumes have

been loaned officers and employees of the War Department, besides 4,516 which have been consulted in the library.

In accordance with law the use of the library has been extended by the Secretary of War, under proper restrictions, to the faculty and students of the Columbian University. Historical students in steadily increasing numbers visit this library for study and research, and to them are accorded the amplest facilities permitted by the limited space. In order to increase the utility of the library two special subject catalogues of its publications have been issued, namely, Military Biographies and Military Literature Relating to the Participation of the Individual States in the War for the Union. These publications greatly facilitate the researches of officers and others who are studying along these lines.

The library force should be placed on a permanent and satisfactory footing. While the work has increased 40 per cent, by the devolving on the library the distribution of public documents, its clerks have been reduced from five to three. The librarian should be restored to his former grade of fourth-class clerk and the first assistant should be a second-class clerk. The detailed clerk, whose services are indispensable to efficient management of the library, should be appropriated for as part of the library force.

The current library work and the disposition of public documents have only been accomplished through the ability and unremitting application to these duties of the present clerical force. The removal of anyone from the library, where special knowledge is indispensable, would be detrimental to the public service.

Especial attention has been given to the cataloguing, filing, and arranging of the very valuable photographs and photographic negatives relating to the war for the Union. There are now over 8,000 such photographs on file in the War Department library. These valuable collections have been placed beyond the chance of future injury and are so arranged that any single photograph can be at once reproduced. The process of identification has of necessity been slow and there are yet several hundred portraits of distinguished soldiers and civilians in the unrecognized list. During the year a finding list of the photographs and photographic negatives has been printed, thus widely extending the value and knowledge of these collections.

The practice of loaning these negatives to private parties or for commercial enterprises has, fortunately, been abandoned, owing to the certainty, based on past experience, that this collection would shortly be made nearly valueless by destruction or injury. In exceptional cases, where such action would be in the public interests, or as a proper concession to surviving relatives, permission is granted, in accordance with the instructions of the Secretary of War, for reproductions of selected photographs under rigid restrictions insuring the safety of the negatives.

DISTRIBUTION OF PUBLIC DOCUMENTS.

Under the act of Congress approved January 12, 1895, the Chief Signal Officer of the Army was designated by the Secretary of War to supervise the distribution of War Department documents. This law radically changes the system of distribution of current publications and arranges for the disposal of surplus public documents under certain restrictions. It has been impossible to fully carry out the provisions, but they are being conformed to as rapidly as the decisions and actions of the superintendent of public documents will permit. There are at least

10,000 documents ready to be transferred as the law directs, which, through lack of room and force on the part of the superintendent of documents, remain yet in the storeroom of the library, seriously interfering with the arrangement and disposal of the unassorted documents, of which probably as many more yet remain untouched. This distribution of current documents proceeds regularly and systematically; the additional work being performed without any increase of library force. About 40,000 publications have been handled in the way of receipt and transfer during the year.

Thousands of applications are yearly received looking to the gratuitous distribution of the many valuable publications of the War Department, which are printed in strictly limited editions in accordance with the law of January 12, 1895. The restrictive features of the law above quoted and the small appropriation for the printing of the War Department make it impossible as a rule to act favorably on these requests. After the urgent needs of the War Department and of the Army are supplied the few remaining publications are necessarily issued in the way of exchanges or to persons whose relations to the Army or to the War Department make such issues acts of reciprocity. For instance, a copy of every military publication is sent to the adjutant-general of each State or Territory, but the Department can not spare publications for the use of the various organizations of the National Guard. It seems most advisable, however, that such action should be taken as will permit the National Guard to purchase at its own expense the military publications of the War Department. It is therefore recommended that the provisions of the present law permitting the purchase of ordnance and quartermaster's stores from the permanent appropriation of the militia be so extended as to authorize the purchase of military publications and other stores under such restrictions as may be imposed by the Secretary of War.

Very respectfully,

A. W. GREELY,
Brigadier-General, Chief Signal Officer U. S. Army.

Hon. RUSSELL A. ALGER,
Secretary of War.

TABLE 1.

United States military telegraph lines, location, length, etc.

Sections and stations.	Length.	Operators.
Department of the Colorado.		
Holbrook-Wilcox section:	*Miles.*	
Holbrook, Ariz	0	Sergeant, Signal Corps.
Snowflake, Ariz	32	Civilian.
Cooleys Ranch, Ariz	68	Sergeant, Signal Corps.
Fort Apache, Ariz	92	Do.
San Carlos, Ariz	163	Do.
Geronimo, Ariz	190	Railroad operator.
Cedar Springs, Ariz	228	Sergeant, Signal Corps.
Fort Grant, Ariz	248	Do.
Wilcox, Ariz	274	Do.
Cedar Springs-Mammoth branch:		
Cedar Springs, Ariz	0	Do.
Hellners Ranch, Ariz	13	Detailed man.
Mammoth, Ariz	42	Do.
Bisbee-San Bernardino section:		
Bisbee, Ariz	0	Railroad operator.
United States custom house	9	Custom-house official.
San Bernardino, Ariz	42	Sergeant, Signal Corps.
Fort Duchesne-Price section:		
Fort Duchesne, Utah	0	Do.
Duchesne Bridge, Utah	12	Stage-station keeper.
The Wells, Utah	26	Do.
Lees Ranch, Utah	50	E. C. Lee.
Price, Utah	87	Sergeant, Signal Corps.
Fort Bayard-Silver City line:		
Silver City, N. Mex	0	Do.
Fort Bayard, N. Mex	8	Detailed man.
Halls Station, N. Mex	13	Railroad operator.
Fort Huachuca line:		
Fort Huachuca, Ariz	0	Sergeant, Signal Corps.
Huachuca Siding, Ariz	7	Railroad operator.
Fort Wingate line:		
Fort Wingate, N. Mex	0	Detailed man.
Wingate Station, N. Mex	3	Railroad operator.
Department of Dakota.		
Fort Yates-Bismarck section:		
Bismarck, N. Dak	0	Civilian.
Cannon Ball, N. Dak	41	Do.
Fort Yates, N. Dak	65	Sergeant, Signal Corps.
Department of the Missouri.		
Fort Reno-Elreno line:		
Fort Reno, Okla	0	Sergeant, Signal Corps.
Elreno, Okla	5	Civilian.
Fort Sill-Rush Springs line:		
Fort Sill, Okla	0	Sergeant, Signal Corps.
Rush Springs, Ind. T	28	Civilian.
Department of Texas.		
Fort Brown-Fort McIntosh section:		
Fort Brown, Tex	0	Civilian.
Santa Maria, Tex	24	Do.
Edinburg, Tex	51	Do.
Fort Ringgold, Tex	100	Sergeant, Signal Corps.
Roma, Tex	.....	Civilian.
Carrizo, Tex	.....	Do.
Laredo, Tex	200	Do.
Fort Clark-Spofford Junction line:		
Fort Clark, Tex	0	Detailed man.
Spofford Junction, Tex	10	Civilian.
Fort Bliss-El Paso line:		
El Paso, Tex	0	Do.
Fort Bliss, Tex	6	Sergeant, Signal Corps.
Department of the Platte.		
Fort Niobrara-Valentine line:		
Valentine, Nebr	0	Civilian.
Fort Niobrara, Nebr	4	Sergeant, Signal Corps.
Fort Washakie-Lander line:		
Lander, Wyo	0	Civilian.
Fort Washakie, Wyo	16	Detailed man.

TABLE 2.

Number of officers and enlisted men, by regiment and company, reported proficient on June 30, 1897.

CAVALRY.

Regiment.	Troop A.		Troop B.		Troop C.		Troop D.		Troop E.		Troop F.		Troop G.		Troop H.		Troop I.		Troop K.		Total.	
	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.
1	1	3	0	0	0	0	0	3	0	2	1	5	0	0	0	2	1	2	1	6	4	23
2	1	6	0	3	1	5	1	6	0	3	1	4	1	6	1	5	2	7	1	3	9	48
3	1	0	1	1	1	6	0	2	1	3	1	4	1	4	1	0	1	1	0	1	8	22
4	0	0	1	7	1	4	0	0	0	0	1	1	0	0	0	0	1	4	1	3	4	19
5	1	4	1	4	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	2	8
6	0	0	1	2	0	0	0	3	0	0	1	3	0	0	0	0	1	5	0	0	3	13
7	0	4	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	2	3	4	9
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	1	4	1	0	1	0	1	4	1	3	1	0	2	1	1	3	0	4	0	0	9	19
10	0	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0
Total																					47	161

ARTILLERY.

Battery.	Regiment 1.		Regiment 2.		Regiment 3.		Regiment 4.		Regiment 5.	
	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.
A	0	5	0	0	1	4	0	0	0	0
B	0	5	1	4	0	4	0	0	1	14
C	0	1	1	4	1	4	1	1	2	10
D	0	4	0	4	0	0	1	4	0	0
E	0	0	0	1	1	11	0	4	1	5
F	0	4	1	2	1	4	0	0	0	0
G	0	4	0	2	1	4	0	0	0	5
H	1	8	1	9	0	0	0	4	0	0
I	4	0	4	0	0	0	0	0	0	0
K	0	0	0	0	1	4	0	6	3	5
L	0	0	0	0	1	4	1	2	2	3
M	0	1	2	4	0	0	0	0	2	20
Total	5	32	10	30	7	39	3	21	11	62

Officers proficient 36
Men proficient 184

INFANTRY.

Regiment.	Company A.		Company B.		Company C.		Company D.		Company E.		Company F.		Company G.		Company H.		Total.	
	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.	Officers.	Men.
1	1	4	1	4	1	3	1	4	0	4	2	4	1	4	1	6	8	33
2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
3	1	4	1	4	1	4	1	4	1	4	1	3	1	4	1	4	8	31
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	3	0	1	0	4	0	2	1	3	0	5	0	2	0	0	1	22
8	1	1	0	4	0	1	0	3	0	2	0	4	0	3	0	3	1	21
9	0	0	0	0	0	1	0	2	0	0	0	3	0	3	1	0	1	9
10	0	0	0	1	0	3	0	2	0	2	0	0	0	1	0	0	0	9
11	0	0	1	3	1	3	0	0	1	4	0	0	1	6	1	0	5	16
12[a]	0	7	1	5	1	7	0	5	0	5	0	6	1	5	1	4	5	44
13[b]	1	7	0	0	1	5	0	0	1	4	0	0	2	5	0	4	6	25
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	1	0	0	1	1	0	0	0	0	0	1	0	2	0	3	1	12
16	1	0	1	6	0	0	0	0	1	0	0	0	0	0	0	0	3	12
17	1	4	1	4	1	4	1	4	1	0	1	4	1	4	1	4	8	32
18[c]	0	3	0	4	0	3	0	4	1	0	0	1	1	3	0	4	4	25
19	1	3	0	0	0	0	0	0	1	0	0	0	1	2	1	5	4	15
20	0	0	1	4	0	0	0	0	0	0	0	0	1	5	1	7	3	16
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	4
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	4	5	12
Total																	65	338

[a] In Company K, one officer. [b] In Company I, one officer.
[c] In Company I, one officer, and in Company K, one officer.

TABLE 3.

The conditions of the appropriations for the fiscal year ended June 30, 1897, with the expenditures thereunder, balances and probable demands on such balances, report of which is required to be rendered by the act of Congress approved May 1, 1820, is as follows:

Signal Service of the Army, 1897.

Appropriated	$18,000.00
Expended	15,943.88
Balance	2,056.12
Probable demands	2,036.50

Military telegraph line Fort Ringgold, Tex., to Fort McIntosh, Tex. (permanent specific appropriation).

Appropriated	$17,000.00
Expended	16,585.00
Balance	415.00

TABLE 4.

Instructions for using the heliograph of the Signal Corps, United States Army.

[Authorized by G. O. No. 99, 1888, amended by G. O. No. 59, 1889, and G. O. No. 32, 1896, Headquarters of the Army, Adjutant General's Office.]

THE HELIOGRAPH OF THE UNITED STATES SIGNAL CORPS.

In order to extend the operations of the Signal Corps between stations with great intervening distances an appliance with a greater range than the flag became necessary, and this need was met by the heliograph. It may be said that the evolution of the heliograph of the Signal Corps is the outcome of extended experiments and intel-

ligent criticisms of signalists both here and abroad, and marks the most important advance in the art of visual signaling.

The important advantages of the heliograph of the Signal Corps of the United States Army are its fixed flash, simplicity of form, strength of construction, reasonable weight, interchangeable parts, small, square, perfect mirrors, accuracy of sight and adjustment, stability in use, and a complete separation of the flash mirror from the screen.

The difficulty of securely clamping the mirror bar after the general direction of the distant station had been determined has been overcome by the introduction of a female screw with a milled head which firmly holds the bar in position with no liability to accidental derangement.

The heliograph with its transmitted sun flashes now replaces the flag on all important service, as it can be relied upon for very much greater distances, since dust and smoke, which would totally obscure even the largest flag, cease to be obstacles to the sun flash, which penetrates them without difficulty. Such flashes have been read by the unaided eye at distances of 15 miles through smoke and haze so dense that the sending station could not be seen, even with a signal telescope of thirty powers.

The English heliograph consists of a movable mirror, mounted upon a horizontal axis, with an attached finger key which controls the movement of the mirror. When the key is pressed down, if the mirror is properly adjusted, it throws a sun flash to the distant station, and when the pressure is removed from the key a spring returns the mirror to its original position and the direction of the flash is so changed that the signal is no longer visible at the distant station. This form of heliograph was very satisfactory in many respects, and it proved to be of great utility to the British army during many of their campaigns in India and Africa. There were, however, two quite serious objections to this method of operating the mirror: First, very careful attention to the adjustment of the heliograph was necessary in order to direct the flash constantly and steadily upon the receiving station; second, the direction of the flash was liable to be deflected from the out station through the manipulation of the key, causing derangement in the position of the mirror.

The method adopted by the Signal Corps of the United States Army, differing radically from the English plan, materially reduces the first difficulty and entirely overcomes the second. The mirrors and screen are fixed upon separate tripods, so that the mirrors are entirely unaffected by the manipulations of the signalman using the screen. In communicating with the distant station after the flash is directed upon it, two tangent screws upon the mirror bars and frame—one screw causing a horizontal motion and the other a vertical motion—give slow and suitable motions to the mirror, so as to constantly and steadily keep the full flash of the sun upon the distant station. The flash is kept accurately adjusted by means of a dark spot arising from an unsilvered point in the center of the mirror. The transmission and interruption of the flash is effected by the operation of a detached screen which is so placed that when closed it entirely obscures the flash and when open permits the free passage of the beams of the reflected light to the receiving station. While the American method of signaling by heliograph requires an additional piece, i. e., the screen, yet this affords the evident advantage of rendering communication with the distant station more certain, since the direction of the flash can not possibly be altered by the manipulation of the key.

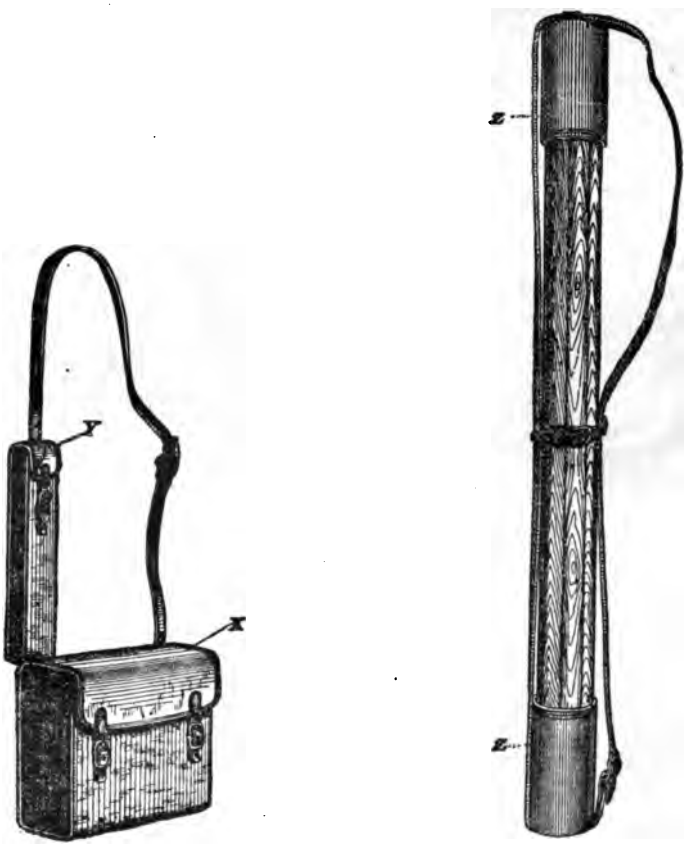
Two sizes of heliographs are used by the Signal Corps of the Army. The mirror of the standard *field* heliograph is 4½ inches square, and with this mirror communication can, under favorable conditions, be relied upon for distances up to 30 miles with the naked eye, and is readily used for distances of 60 miles or more when using the Signal Corps telescope. Messages have been sent with it over a range of 90 miles, and the flash has been distinguished at 125 miles. For very great distances, however, the *station* heliograph is used, which is of the same design as the standard field instrument, but is considerably larger, carrying mirrors 8 inches square. With a heliograph of this size a message has been sent and received at a distance of 183 miles.

It is evident that the great distance at which the smaller mirrors have been successfully read is directly dependent upon the perfection of the mirror. While, as a general rule, the brightness of the sun flash depends upon the size of the mirror, everything else being equal, it should be observed that the flash from a larger mirror, with a surface not perfectly plane, will not favorably compare with that from a smaller and more perfect mirror, since from the imperfect larger surface the sun's rays will be dispersed and interference will occur with resultant diminution of the brightness of the flash. Moreover, in the case of a mirror whose surfaces are not accurately parallel, false images of the sun will be produced, which, while less bright than the true images, are liable to cause trouble, the receiving station sometimes attempting to adjust its heliograph on this false image, wherefrom unsatisfactory flashes and annoying delays often result.

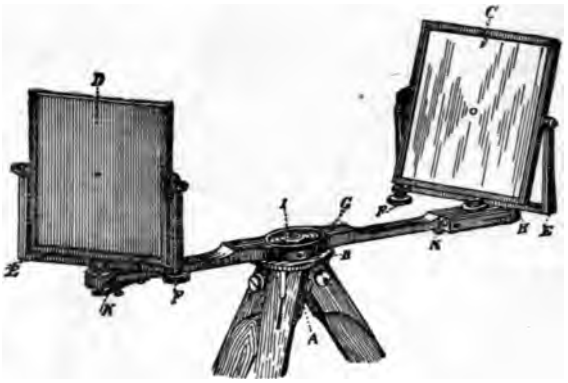
DESCRIPTION.

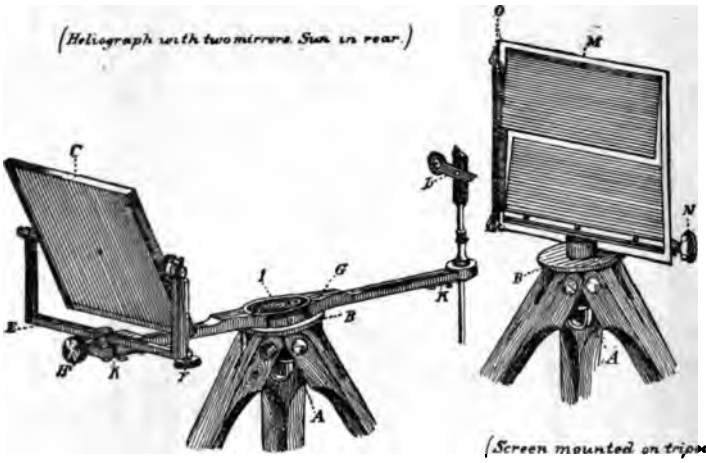
The field heliograph equipment consists of—

X A sole-leather pouch, containing:
One sun mirror. } Inclosed in a wooden box.
One station mirror. }
One screen. One sighting rod. One screw-driver.
Y A smaller pouch, sliding by two loops upon the strap of the larger, containing: One mirror bar.
Z A skeleton case, containing: Two tripods.



(Heliograph equipment packed.)





(Heliograph with one mirror and sighting rod. Sun in front.)

A Tripod.
B Tripod head.
C Sun mirror.
D Station mirror.
E Mirror supports.
F Tangent screw for revolving mirror about horizental axis.
G Mirror bar.
H Tangent screw with ball bearings for revolving mirror about vertical axis.
I Clamp screw for attaching mirror bar to tripod.
K Spring for clamping mirrors and sighting rod.
L Sighting rod with movable disk.
M Screen.
N Key for screen.
O Screen spring.

The *sun mirror* has an unsilvered spot at its center, the *station mirror* a paper disk; in other respects they are similar.

The tangent screw attachment to the frame affords the means of revolving the mirror about a horizontal axis.

The support to the frame has a conical projection accurately turned to fit the socket of the mirror bar, and grooved to receive the clamp spring.

The *screen* is provided with a key, by which, in connection with the action of a spring, it is operated to reveal and cut off the flash.

The base of the frame carries a female screw for attachment to the tripod.

The *sighting rod* is fitted to the socket of the mirror bar, and is clamped in the same manner as the mirrors. It carries at one end a movable disk, which, when turned down, reveals the front sight.

A piece of white paper should be slipped into the disk to receive the "shadow spot," and a slight puncture made therein coincident with the point of the front sight as a guide in adjustment.

Vertical adjustment of the disk is made possible by loosening the milled slide.

The *mirror bar* is provided with a clamp, threaded to fit the screw of the tripod. The release of the clamp permits movement of the bar independently of the screw.

At one end is attached the tangent screw for revolving mirror about a vertical axis, and it should be observed that under all circumstances the *sun mirror* should be clamped to this end, while the socket at the other extremity is designed to receive the station mirror or the sighting rod.

A movable spring is placed under each end of the mirror bar for clamping mirrors and sighting rod.

The *tripods* are similar, the screw of either serving equally well for the attachment of mirror bar or screen.

Both are provided with a hook for the suspension of a weight to give greater stability when required.

SETTING UP AND ADJUSTING.

The position of the sun is the guide for determining whether one or two mirrors should be used.

When the sun is in front of the operator—that is, in front of a plane through his position, at right angles to the line joining the stations—the sun mirror only is required; with the sun in rear of this plane both mirrors should be used, although a single mirror may often be worked to advantage with the sun well back of the operator. In the former case, the rays of the sun are reflected from the sun mirror direct to the distant station; in the latter, they are reflected from the sun mirror to the station mirror, thence to the distant observer.

With one mirror.—Firmly set the tripod on the ground; attach the mirror bar to the tripod; insert and clamp in their appropriate sockets the sun mirror and the sighting rod, the latter with its disk turned down. Sight through the *center* of the unsilvered spot in the mirror and turn the mirror bar, and raise or lower the sighting rod until the center of the mirror, the extreme point of the sighting rod, and the distant station, are accurately in line; then firmly clamp the mirror bar to the tripod, taking care not to disturb the alignment. Turn up the disk of the sighting rod.

Move the mirror by means of the slow-motion screws until the "shadow spot" falls upon the paper disk in the sighting rod. The flash will then be visible to the distant observer.

The shadow spot must be kept in the center of the disk while signaling.

Attach the screen to its tripod and place it close to, and in front of, the sighting disk, so as to intercept the flash.

With two mirrors.—Firmly set the tripod on the ground; clamp the mirror bar diagonally across the line of vision to the distant station; clamp the sun mirror, facing the sun, to the end of a mirror bar with tangent-screw attachment, and the station mirror, facing the distant station, to the other socket. Stooping down, the head in rear of and near the station mirror, turn the sun mirror by means of its slow-motion screws until the whole of the station mirror is seen reflected in the sun mirror, and the unsilvered spot and reflection of the paper disk accurately cover each other.

Still looking into the sun mirror, turn the station mirror until the reflection of the distant station is brought accurately into line with the top of the reflection of the disk and the top of the unsilvered spot of the sun mirror; after this the station mirror must not be touched.

Now, stepping behind the sun mirror, throw upon the station mirror a full flash from the sun mirror so that the "shadow spot" falls upon the center of the paper disk. The flash will then be visible at the distant station.

The method of making the adjustment is similar to sighting with a rifle, considering the top of the unsilvered spot of the sun mirror as the rear sight, the top of the reflection of the paper disk of the station mirror as the front sight, and the reflection of the distant station as the target.

The shadow spot must be kept in the center of the paper disk while signaling.

Attach the screen to its tripod and place it, so as to intercept the flash, in a position convenient for maintaining adjustment of the sun mirror while working.

In setting up the instrument, spread the tripod legs sufficiently to give a good base, and on yielding soil firmly press into the ground, the head approximately level. In a high wind, ballast by hanging a substantial weight to the hook. If the legs become loose at the head joints, apply the screw-driver to the assembling screws.

See that the screen completely obscures (cuts off) the flash; also, that the flash passes entire when the screen is opened. The spring should sharply return the screen to its normal position when key is released. If it fails to promptly respond, strengthen or replace the spring.

Extra care bestowed on preliminary adjustment is repaid by increased brilliancy of flash. With alignment absolutely assured and the shadow spot at the center of the disk, the axis of the cone of reflected rays is coincident with the line of sight, and the distant station receives the greatest possible intensity of light.

The distant operator is necessarily the best judge as to the flash received; if, therefore, adjustment is called for when the shadow spot is at the center of the disk, adjustment is probably at fault and should be attended to at once.

The tendency of the shadow spot to move off the disk, due to the apparent motion of the sun, is compensated for, without interrupting signals, by means of the tangent screws of the sun mirror. The movement imparted by these screws to the mirror does not disturb alignment, as its center (the unsilvered spot) is at the intersection of the axes of revolution.

It is of the utmost importance that uniformity in mechanical movement of the screen be cultivated, as lack of rhythm in the signals of the sender entails unnecessary and vexatious concentration of attention upon the part of the receiver.

For the "1," the flash is almost instantaneous. To avoid continuity of light, release the screen at the moment of depression. "Clipping" should be guarded against by fully opening the screen before releasing the key.

The manipulation of the instrument involves but slight manual labor; the strain on the eyes, however, from the flash of the mirrors in receiving is often considerable, but may be modified by the use of stained glasses. It will also occasionally be found advantageous to screen the eyes from the glare of surrounding objects.

Ability to read signals from the heliograph may be readily acquired, but may also be as readily lost if practice be discontinued before proficiency is attained. It should therefore be the endeavor to acquire such facility, not only in sending but in receiving, that *habit* will come to the aid even after the lapse of considerable time.

Minor parts of the instrument should be dismounted only to effect repair, for which purpose spare parts are furnished on requisition. All steel should be preserved from rust, and tangent screws and bearings from dust and grit. The mirrors should invariably be wiped clean before using. In case of accident to the sun mirror, the station mirror may be made available as such by removing the paper disk.

The projection of the rays of the sun upon a screen by reflection from plane mirrors, demonstrates that for short distances (varying with the sizes of the mirrors employed) the figures of illumination are similar to those of the mirrors used. Removing the mirrors to a greater distance from the screen, it is found that the shapes of the mirrors are no longer reflected, but that all images are circular and of the same diameter. Removing the mirrors to a still greater distance, it is found that the various images are circular as before and of the same diameter, but that this latter diameter is greater than the one previously obtained. Repeating the experiment at increased distances, these results are confirmed, with the following conclusions:

a. That up to a certain distance the form of the mirror is reflected upon the screen.

b. That this distance once exceeded, the reflected images obtained from mirrors of various shapes and sizes are all *circular* and of *equal* diameters at *equal* distances.

c That the greater the distance from the mirror to the screen, the greater the diameter of the reflected image.

d. That the images vary in brightness, the larger mirrors producing the brighter images.

It is therefore evident that the advantage derived from the use of a large mirror consists, not in any increase in the *size* of the flash, but in an increase of *brightness*, i. e., capability for overcoming such obstructions as fog, smoke, haze, and consequently distance.

The mirrors should fit snugly, but not tightly, in their frames. Great care should be exercised in this as even a slight pressure destroys the plane surface of the mirror; this produces distortion of the reflection and consequent loss of intensity of the sun flash.

The light from the sun is projected upon the surface of the mirror in a cone of rays and is reflected in a cone of the same dimensions. The angle within which reflection is visible is that subtended by the diameter of the sun. The limit of the lateral extension of the flash at any given distance may therefore be definitely determined, and it is found that *the circle of illumination has a diameter which increases sixteen and one-third yards for every mile of distance from the mirror.*

As the diameter of the flash increases directly with the distance between stations, adjustment of the instrument is therefore as certain for great as for short distances.

Although the margin of flash is ample, so that signals may be directed upon a station, however distant, with certainty, yet it is so slight relative to the distance between communicating points that signals are invisible to one far out of the direct line, and are therefore not liable to be read by those for whom not intended.

It is evident from the proportion between the diameter of the flash and the distance that the instrument may be used in estimating distance between stations. In practice the dispersion of rays due to imperfections of the mirror makes the determination of the exact limit of the flash a matter of some uncertainty, but a fair approximation to the true distance may often be obtained when conditions are favorable.

For permanent stations an 8-inch mirror is contemplated, with provisions for

attachment to a post, the stump of a tree, or some other firm base by means of screws, entirely dispensing with the tripod. The range over which signaling may be effected by means of this instrument, under favorable atmospheric conditions, is limited only by the convexity of the earth. The square mirror is adopted in preference to the round, as containing about one-fourth more reflecting surface for practically the same packing space.

Signaling at moderate range by night may be effected by *moonlight;* also by the employment of *artificial light.* This latter fact makes possible practice with the instrument in the squad room.

Occasionally the receiving station is in cloud while the sun is shining at the sending station. When these conditions obtain the receiving station can not break, and the sending station should exercise care to transmit each letter slowly and with the utmost distinctness. If the message is important it should be repeated by the sending station in order to insure that the receiving station receives, on repetition, any words that may have been missed when first sent. The receiving station will, at the first opportunity, acknowledge by their numbers and time of receipt messages so received. In such cases, where it is uncertain that the transmitted message has been correctly and fully received, the facts in each case should be communicated to the originator of the message by the sending station.

No message will be considered sent until its receipt has been acknowledged by the receiving station.

When the exigencies of service are such that but one man is on a station, particular care should be taken by him that his flash falls with full intensity upon the receiving station; he should therefore adjust his mirror with such frequency as will with certainty insure this.

The "1" and the elements of "2" are represented by a momentary exposition of the flash, and the duration of this exposition constitutes the *unit of time.*

The "3" is represented by an exposition of the flash for a period of three units of time.

The *pause* between the elements of a letter is equivalent to the unit of time; that between letters to three such units, and between words to six units.

Use short flash for "1," two short flashes in quick succession for "2," and a long steady flash for "3." In visual signals the exposition of the signal representing the elements of letters should be slightly longer than in sound signals.

The first position is to turn a steady flash on the receiving station; the signals are made by alternate obscuration and revelation.

To call a station, make the "call letter" until acknowledged. Each station will then turn on a steady flash and adjust. When the adjustment is satisfactory to the called station, it will cut off its flash, and the calling station will proceed with its message.

If the receiver sees that the sender's mirror needs adjusting, he will turn on a steady flash until answered by a steady flash. When the adjustment is satisfactory, the receiver will cut off his flash, and the sender will resume his messsage.

To break the sending station for other purposes, turn on a steady flash and call for repeat, etc., as occasion requires. All other conventional signals are the same as for the flag, etc.

The following will be the order of transmitting the several parts of a message: First, number of message and "call letter" of sending station; second, operator's personal signal; third, the check; fourth, place from and date; fifth, address in full; sixth, "33" (address complete); seventh, body of message; eighth, Sig (signature follows); ninth, signature.

Example.

The message—

"KENNESAW, GA., *October 6, 1864.*

"General CORSE,
"*Allatoona, Ga.*

"Let the Rome force return at once to Rome and protect the road. I will cover Allatoona.

"W. T. SHERMAN,
"*Major General.*"

Would be sent—

No 1 K Jo 17 O B Kennesaw Ga 6 To General Corse Allatoona Ga. Let the Rome force return at once to Rome and protect the road. I will cover Allatoona Sig W T Sherman Major General

HELIOGRAPH CODE.

THE MYER SYSTEM FOR U. S. ARMY AND U. S. NAVY.

A.....22	J.....1122	S.....212
B.....2112	K.....2121	T.....2
C.....121	L.....221	U.....112
D.....222	M.....1221	V.....1222
E.....12	N.....11	W.....1121
F.....2221	O.....21	X.....2122
G.....2211	P.....1212	Y.....111
H.....122	Q.....1211	Z.....2222
I.....1	R.....211	tion.....1112

NUMERALS.

1.....1111	2.....2222
3.....1112	4.....2221
5.....1122	6.....2211
7.....1222	8.....2111
9.....1221	0.....2112

ABBREVIATIONS.

a.....after	n.....not	ur.....your
b.....before	r.....are	w.....word
c.....can	t.....the	wi.....with
h.....have	u.....you	y.....yes

CONVENTIONAL SIGNALS.

End of a word.....3	Wait a moment.....1111 3
End of a sentence.....33	Repeat after (word).....121 121 3 22 3 (word).
End of a message.....333	Repeat last word.....121 121 33
xx3.....numerals follow (or) numerals end.	Repeat last message.....121 121 121 333
sig 3.....signature follows.	Move a little to right.....211 211 3
Error.....12 12 3	Move a little to left.....221 221 3
Acknowledgment, or "I understand".....22 22 3	Signal faster.....2212 3
Cease signaling.....22 22 22 333	

CODE CALLS.

I C U—International Code Use.
T D U—(Navy) Telegraph Dictionary Use.
G L U—(Navy) Geographical List Use.
G S U—(Navy) General Signal Use.
N L U—Navy List Use.
V N U—Vessels Numbers Use.
C A U—Cipher "A" Use.
C B U—Cipher "B" Use. } These calls are for preconcerted use in or with the Navy.
C C U—Cipher "C" Use.

A. W. GREELY,
Brigadier-General, Chief Signal Officer, U. S. Army.

WASHINGTON, *May 8, 1897.*

REPORT OF THE CHIEF OF THE RECORD AND PENSION OFFICE.

REPORT

OF THE

CHIEF OF THE RECORD AND PENSION OFFICE.

RECORD AND PENSION OFFICE,
WAR DEPARTMENT,
October 1, 1897.

SIR: The work of the Record and Pension Office consists in the transaction of the business of the War Department relating to the volunteer forces in the service of the United States during the various wars in which the country has been engaged, including the Revolution, the war of 1812, the various Indian wars, the war with Mexico, and the war of the rebellion.

During the past fiscal year, as heretofore since the organization of the office, the clerical force has been steadily and profitably employed, the current business having been promptly dispatched and satisfactory progress having been made in transcribing and compiling the records of personal military service.

The number of cases received and disposed of during the fiscal year ended June 30, 1897, is as follows:

From the Pension Office	97,043
From the Auditor for the War Department	19,537
Remuster cases	2,033
Desertion cases	4,165
All other cases, miscellaneous	27,029
Total	149,807
On hand June 30, 1897	None.

Of the cases represented in the foregoing table, 107,369 were of the class known as "statement of service cases," requiring the preparation of military histories of individual officers and enlisted men, a majority of which were for the Commissioner of Pensions, the accounting officers of the Treasury, and other bureau officers charged with the adjudication of claims on account of services rendered during the late war. Considerable clerical labor and the exercise of extreme care are involved in the preparation of these reports, as they are made the basis of the disbursement of large sums of money, and upon their completeness and accuracy the interests of the Government and of individual claimants largely depend.

But while the "statement of service" cases referred to above are of great importance, requiring care and constant scrutiny, they are not of the class demanding the administrative action of the Department. As pointed out in former reports, the current business of the office is becoming more complicated and difficult as the period of service in the

volunteer armies becomes more remote, and the number and percentage of cases requiring special investigation and administrative action are constantly increasing. Of the 149,807 cases received during the past fiscal year, 42,438 were of this class, many of them involving questions of military law, the determination of the military status of individual officers and enlisted men and the proper construction of defective, complicated, and contradictory records.

The "remuster" and "desertion" cases mentioned in the statistical table form an important feature of the current work, requiring the exercise of care and discretion in the consideration of testimony and the application of the laws under which they are presented. These cases will receive further consideration in another portion of this report.

The cases referred to in the statistical table under the head of "Miscellaneous" are of great variety, covering a multitude of subjects not easily classified. Conspicuous in the general correspondence of the office, however, may be mentioned the numerous inquiries received from the descendants of soldiers of the Revolutionary war and the war of 1812, and from representatives of the various patriotic societies relative to service in those wars. Since the date of the last annual report the reproduction of the records of the war of 1812 by the index-record card system has been practically completed, and the Department is now able to satisfy the demands made upon it by persons desiring information with regard to service in that war, and to furnish such information relative to service in the Revolutionary war as the imperfect records of that war afford.

Promptness in the transaction of the public business has always been a prominent object in the administration of this office, and it is gratifying to be able to state that during the past fiscal year the current business was kept close up to date, more than 96 per cent of the cases received having been disposed of within twenty-four hours from the time they reached the office. As shown in the statistical table before referred to, not one case remained undisposed of when the fiscal year expired on the 30th of June, 1897.

REMUSTER.

At the date of the last annual report there was no law in existence under which persons who were commissioned as officers of volunteer organizations in service during the late war could be recognized as having been in the military service of the United States under their commissions, or could be paid for services rendered thereunder, for any period prior to the dates from which they were originally recognized during the war by their actual muster into service, unless their claims for such recognition and pay had been filed on or before June 3, 1895, the date of the expiration of the act of Congress approved June 3, 1884, and the acts amendatory and in extension thereof, commonly known as the "remuster laws." The object of this legislation, which was the result of a series of amendments of a joint resolution approved July 26, 1866, "for the relief of certain officers of the Army," was to provide payment for services rendered under certain conditions, as commissioned officers of volunteers, by persons who were not recognized by their muster into service, as of the grades to which commissioned, during and for the period in which the service was performed.

Several bills were introduced during the first session of the Fifty-fourth Congress providing for a limited extension of the time for filing claims under the old law, but a substitute, prepared by this office and

submitted by the Secretary of War to the military committees of the two Houses of Congress, was adopted, and resulted in an enactment, approved February 24, 1897, of which the following is a copy:

AN ACT to provide for the relief of certain officers and enlisted men of the volunteer forces.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That any person who was duly appointed or commissioned to be an officer of the volunteer service during the war of the rebellion, and who was subject to the mustering regulations at the time applied to members of the volunteer service shall be held and considered to have been mustered into the service of the United States in the grade named in his appointment or commission from the date from which he was to take rank under and by the terms of his said appointment or commission, whether the same was actually received by him or not, and shall be entitled to pay, emoluments, and pension as if actually mustered at that date: *Provided,* That at the date from which he was to take rank by the terms of his said appointment or commission there was a vacancy to which he could be so appointed or commissioned, and his command had either been recruited to the minimum number required by law and the regulations of the War Department, or had been assigned to duty in the field, and that he was actually performing the duties of the grade to which he was so appointed or commissioned; or if not so performing such duties, then he shall be held and considered to have been mustered into service and to be entitled to the benefits of such muster from such time after the date of rank given in his commission as he may have actually entered upon such duties: *Provided further,* That any person held as a prisoner of war, or who may have been absent by reason of wounds, or in hospital by reason of disability received in the service in the line of duty, at the date of issue of his appointment or commission, if a vacancy existed for him in the grade to which so appointed or commissioned, shall be entitled to all the benefits to which he would have been entitled under this Act if he had been actually performing the duties of the grade to which he was appointed or commissioned at said date: *Provided further,* That this Act shall be construed to apply only in those cases where the commission bears date prior to June twentieth, eighteen hundred and sixty-three, or after that date when the commands of the persons appointed or commissioned were not below the minimum number required by then existing laws and regulations: *And provided further,* That the pay and allowances actually received for the period covered by the recognition extended under this Act shall be deducted from the sums otherwise to be paid thereunder.

SEC. 2. That the heirs or legal representatives of any person whose muster into service shall be recognized and established under the terms of this Act shall be entitled to receive the arrears of pay and emoluments due, and the pension, if any, authorized by law, for the grade to which recognition shall be so extended.

SEC. 3. That the pay and allowances of any rank or grade paid to and received by any military or naval officer in good faith for services actually performed by such officer in such rank or grade during the war of the rebellion, other than as directed in the fourth proviso of the first section of this Act, shall not be charged to or recovered back from such officer because of any defect in the title of such officer to the office, rank, or grade in which such services were so actually performed.

SEC. 4. That all acts and parts of acts inconsistent with the provisions of this Act be, and the same are hereby, repealed.

Approved, February 24, 1897.

The subject to which this legislation relates, and the reasons for the substitution of the new law for the previous enactments, are believed to be of sufficient importance to justify the insertion in this connection of a copy of the report of the Chief of the Record and Pension Office accompanying the draft of the bill which forms the text of the present law. The report, dated February 26, 1896, transmitted by the Secretary of War to the Senate Committee on Military Affairs on the same date, and of which a duplicate was transmitted to the Military Committee of the House of Representatives, is as follows:

Extension of the provisions of an act to provide for the muster and pay of certain officers and enlisted men of the volunteer forces.

The act of June 3, 1884, "to provide for the muster and pay of certain officers and enlisted men of the volunteer forces," as amended by the act of February 3, 1887, and extended by the acts of August 13, 1888, and February 9, 1893, expired by limi-

tation on the 3d day of June, 1895. There is now no law in existence under which persons who were commissioned as officers of volunteer regiments, companies, troops, or batteries can be paid or recognized as having been in the military service of the United States under their commissions for any period prior to the dates from which they were originally recognized during the war by actual muster into service.

The law referred to above, which was in existence for about ten years, between 1884 and 1895, and under which many thousands of claims were passed upon by the War Department, appears to have been enacted upon the principle that persons who, without the formality of muster into the United States service, actually performed the duties of commissioned officers under commissions regularly issued for them, or who, being so commissioned and not mustered, were prevented from performing the duties of the grades named in their commissions by reason of being held as prisoners in the hands of the enemy, or by reason of disabilities incurred in service and in line of duty, were entitled to be recognized and paid as officers in the military service of the United States for the periods during which they performed duty as such officers, or were held as prisoners, or were disabled, provided there were vacancies for them at the time; and provided further, that after June 20, 1863, their commands were not below the minimum number required by then existing laws and regulations.

This law, as stated above, expired by limitation on June 3, 1895, and the bill now under consideration (S. 2101, Fifty-fourth Congress, first session) proposes to revive and extend the provisions of the old law for a period of three years from the date of its expiration.

There is doubtless a considerable number of persons who, from ignorance of the existence of the old law, did not apply for the relief provided by it prior to its expiration. These persons are probably equally as deserving as the far greater number of those to whom the law has already been applied. How large their number may be it is impossible to determine with any degree of accuracy, although they must be few as compared with the many whose claims have already been adjudicated, and it is not conceived that there can be any serious objection to extending the time for filing claims for what Congress, by legal enactment, has declared to be justly due. The five years' extension proposed by the pending bill, a considerable portion of which has already expired, would, however, probably be too short a period for the accomplishment of the purposes for which the original legislation was intended, and as the question of further extension is otherwise liable to arise, no reason is seen why the limitation clause should not be entirely eliminated from the law as it now stands.

But while on the subject of this legislation for the benefit of volunteer officers, it is deemed proper to invite attention to the fact that the law, in its present condition, is the result of a series of amendments of a joint resolution passed in 1866, and that its peculiar structure, incidental to its growth, has been the occasion of a variety of interpretations. The object of the legislation, as before stated, is to extend such recognition to the persons who performed military service under the conditions indicated as shall secure to them and their representatives the benefits that would have accrued to them by their actual muster into service at the time as of the grades for which they were commissioned. One of the anomalies of the acts of 1884 and 1887 is that these acts provide that the persons to whom they relate shall be "considered as commissioned" to the grades to which they were actually commissioned, while as a matter of fact there is not and never was any question as to the fact or date of commission. What these acts were intended to accomplish is to recognize their beneficiaries as having been mustered into service on the dates upon which they entered upon duty under their commissions with the commands required by law and the mustering regulations. What is really accomplished is a legal recognition of an officer as having been commissioned on a certain date (the date from which he entered upon duty), while, as a matter of fact, he may have been commissioned on an earlier date, or to take effect from an earlier date, than that declared under the law.

To avoid the inconsistencies and ambiguities of the old law while in effect continuing its provisions, a draft of a bill is submitted herewith which it is believed will, if adopted, accomplish the object in view. This draft is similar in its general terms to the bill (H. R. No. 870) recently introduced by Mr. Curtis, of New York, and upon which a report was rendered by this office on the 25th of January, 1896, but differs therefrom in all the essential respects in which that bill differs from the law which it is proposed, in the bill now under consideration, to revive.

Compared in detail with the old law, it is to be noted that in its first section the draft now submitted limits its application to those who were "subject to the mustering regulations at the time applied to members of the volunteer service." It is obvious that it was for this class of officers alone that the original legislation was intended. It evidently was not the intention of Congress in its legislation on this subject of "musters" to embrace among its beneficiaries officers who were not subject to muster into service, but who were by law and the regulations of the War

Department placed on a footing with officers of the Regular Army and paid from the dates of acceptance of their appointments, either without commands or without regard to the strength of them, such as general officers of the volunteer forces, officers of the volunteer staff, officers of the Veteran Reserve Corps, etc. The clause in question is an explanatory one, and appears to be free from objection.

The next change to be noted is that in the first section of the draft now submitted the words "shall be considered as having been mustered into the service of the United States" have been substituted for the words "shall be considered as commissioned" in the old law. This change appears to be a good one, because it avoids the anomaly of saying or determining under the law that a man was commissioned on or from a certain date when there is as a rule no question as to the fact that he was commissioned to rank from that or a prior date, although he was not mustered then. The change appears to be advisable for the additional reason that, as the class of officers to which the legislation applies was paid from dates of muster into service, it seems proper, in a law enacted for the purpose of fixing the date from which they shall be entitled to pay, that the date of muster in rather than the date of commission should be determined.

The wording of the old law relative to the benefits to be derived from it is remarkably loose and ambiguous. It was evidently the intention of the legislation to give to an officer recognized under it, or to his heirs if he be dead, the pay, emoluments, and pension that have been, or may be, provided by law for the grade which the officer is recognized as having held in the service. But the old law (sec. 1, act of June 3, 1884) does not provide that an officer himself shall receive a pension of the grade to which the law requires that he shall be "considered as commissioned." It simply declares that he shall be entitled to "all pay and emoluments" that he would have been entitled to if he had actually been mustered into service as of a certain grade on a certain date, but it makes no mention whatever of the subject of pension. On the other hand, section 2 of that act provides that the heirs or legal representatives of an officer whose muster into service has been amended under the act shall be entitled to receive the "arrears of pay" that may be due such officer, and the pension, if any is allowable, "for the grade into which such officer is mustered under the provisions of this act." In other words, under a strict construction of the old law, it might be held that an officer himself would be entitled to receive certain "pay and emoluments," but no pension, while the "heirs or legal representatives" of a deceased officer would be entitled to receive "arrears of pay" and pension, but no "emoluments."

It is true that, so far as is known to this office, the law has never been construed in this way, but has always been construed in accordance with its manifest intent, which was to place the officer himself if living, or his heirs if he be dead, on the same footing as that which he or they would have held under all laws if the officer had actually been mustered into service as of a certain grade at a certain date. But if the law is to be reenacted, it seems to be desirable that this most important portion of it should be couched in language so clear and precise that there shall be no ground for any difference of opinion as to its legal effect. Consequently the loose and indefinite wording of the old law relative to the benefits to be derived from it has not been incorporated in the accompanying draft, but in place thereof there has been embodied in the draft such wording relative to pay, emoluments, and pension as will leave no room for doubt as to the intent and purpose of the law in this respect.

The first section of this draft also contains a proviso, not found in the old law, in the words "and his command had either been recruited to the minimum number required by law and the regulations of the War Department or had been assigned to duty in the field." This provision is intended to apply to officers who were appointed to original vacancies, and is in accordance with the uniform ruling of the War Department. Unless there was a legal command recruited there was no position to fill, and none has been recognized unless the incomplete command was ordered into active service and its completion at the rendezvous of organization was thereby prevented. The insertion of this clause merely gives expression to present rulings under the law, but it will, if enacted, serve to avoid misconception on the part of claimants. That it does not refer to commands reduced by the casualties of the service will be apparent when considered in connection with the third proviso of the original law and of the accompanying draft.

The next departure from the language of the original law to be noted is in the fourth and last proviso of the draft, in which the words "for the period covered by the recognition extended under this act" have been added to the language of the corresponding proviso of the original law, to more clearly express its obvious meaning and to make it explicitly accord with the interpretation that has always been placed upon it.

Section 2 of the proposed bill is a reproduction of the same section of the old law (act of June 3, 1884), with such variation of expression as seems to be necessary to make it consistent with the other changes of phraseology before alluded to.

Section 3 is a reiteration of section 4 of the act of June 3, 1884, with the insertion of the words "other than as directed in the fourth proviso of the first section of this act." This change is necessary to make the section consistent with the proviso referred to as it appears in its original form and as that proviso has been amended in the draft under consideration. The language of the original law in the proviso referred to and in the section now under discussion is indefinite and contradictory, and the object of the amendments proposed is to make explicit the terms of the law and to harmonize the language of its different parts. The change of expression simply makes plain the meaning of the law as it has always been construed by the accounting officers of the Treasury Department.

As before stated in this report, no objection is seen to the proposed extension of the time for filing claims under the act of June 3, 1884, and the acts amendatory thereof, but the question of a renewed extension is almost certain to arise, as it has repeatedly arisen before, and it is a question worthy of consideration at least whether or not the time limit should not be omitted from any future legislation on the subject.

No time limit has been incorporated in the accompanying draft, and it does not seem to be necessary that such a limit should be fixed. Even if the law should be revived without any limitation as to its duration, the number of claims that could be allowed under it must be small as compared with the great number of those that have already been allowed and finally disposed of between 1884 and 1895. But if a time limit of five years should be fixed, as proposed in the accompanying bill, the cases that would remain unacted upon at the expiration of that period, although comparatively few in number and each involving a trifling amount of money, would nevertheless be made the basis of urgent and annoying appeals to Congress for special legislation. This can be avoided by reviving the law, if it is to be revived at all, without any limitation as to its duration, and it is not believed that the absence of such a limitation would add materially to the cost of the law.

But whether or not there is to be a future limitation of time for filing claims, or whatever direction the legislation may take, it is very desirable that the law shall be complete in one enactment and shall be shorn of its former ambiguities, inconsistencies, and apparent contradictions. With this end in view, the accompanying draft of a bill has been prepared, and it is recommended that this be substituted for and considered in the place of the pending bill, which simply proposes to revive the old law with all its defects.

In order that there may be no misapprehension as to the possible effect of the enactment of a law in accordance with the draft herewith submitted, it is deemed proper to remark that such a law would not admit of the consideration or allowance of any claim that could not be considered or allowed under a reenactment of the old law, and under the construction that has heretofore been placed upon that law by the various Executive Departments.

Respectfully submitted.

F. C. AINSWORTH,
Colonel, United States Army, Chief Record and Pension Office.

RECORD AND PENSION OFFICE,
War Department, February 26, 1896.

The SECRETARY OF WAR.

The only important difference in its effects between the old law and the new consists in the fact that the former gave its beneficiaries the right to the pay, allowances, and pension accruing from service in the grades to which they were commissioned, without recognizing them as having been actually in the military service of the United States as of those grades during the period for which recognition was extended, while the new law not only confers the same material benefits, but also recognizes the persons to whom the law is applied as having been in the United States military service in the grades named in their commissions from the dates upon which they entered upon duty under the conditions specified in the law or otherwise fulfilled the requirements of the law. As a result of this recognition of actual rank in the service, a form of certificate has been adopted by the Secretary of War, which is given to officers who were not actually mustered into the service as of the advanced grades to which they were commissioned, and who were therefore discharged the service as of an inferior grade. In this certificate it is declared that the person whose advanced grade has

been recognized was discharged from the service as of that grade, it being a necessary conclusion from the premises that if, under the law, a man held a certain rank in the service from a given date to the date of his discharge, he was also discharged the service as of the same grade.

It may be here remarked that nearly 5,000 cases have been received and considered under the new enactment, and that the expectations formed as to the advantages of the new law over the old fragmentary legislation, pointed out in the reports to the military committees, quoted above, have been fully realized.

It may also be remarked, in connection with the general subject of "remusters," that from 1884 to 1889 more than 14,000 applications for relief under the remuster laws were considered by the Adjutant-General's Office, and that nearly 40,000 such applications have been received and adjudicated by the Record and Pension Office since its organization in 1889.

REMOVAL OF CHARGES OF DESERTION.

The term "desertion cases," as used in the preceding tabular statement, is intended to apply to original applications, and renewals of applications previously acted upon, for removal of the charge of desertion under the provisions of the act of Congress approved March 2, 1889, and the acts amendatory and in extension thereof, providing "for the relief of certain volunteer and regular soldiers of the late war and the war with Mexico." This act, as amended and extended by subsequent legislation, is the only law now in force under which an application for the removal of an existing charge of desertion can be considered. It was evidently intended for the relief of men who, though guilty of a technical violation of military law, were not willful or intentional deserters, and its enactment has resulted in the extension of merited relief to many deserving soldiers and their representatives, who, without such remedial legislation, would have been deprived of the pay and emoluments to which they were equitably entitled.

The number of applications for relief under the law as represented in the tabular statement is considerably in excess of the number of like applications received during the preceding fiscal year. The number of applications received does not, however, represent the number of cases acted upon under the provisions of the law. In the preparation of military histories of ex-soldiers for the Commissioner of Pensions and the accounting officers of the Treasury, the charge of desertion is frequently encountered, and it is the practice to consider such cases under the act of Congress, and, if clearly embraced by its provisions, to remove the charge of desertion without the formality of an application therefor. The number of cases of this class thus incidentally encountered during the past year was in excess of the number of formal applications for relief, the number of the former being 5,981 and of the latter 4,165, making a total of 10,146 cases considered under the act of March 2, 1889, during the fiscal year ended June 30, 1897.

CERTIFICATES OF DISCHARGE IN TRUE NAME.

[Act of April 14, 1890.]

By an act of Congress approved April 14, 1890, entitled "An act for the relief of soldiers and sailors who enlisted or served under assumed names, while minors or otherwise, in the Army or Navy during the war

of the rebellion," it was provided that the Secretary of War and the Secretary of the Navy should be "authorized and required to issue certificates of discharge or orders of acceptance of resignation, upon application and proof of identity, in the true name of such persons as enlisted or served under assumed names, while minors or otherwise, in the Army and Navy during the war of the rebellion and were honorably discharged therefrom;" with the condition, however, that "no such certificate or order shall be issued where a name was assumed to cover a crime or to avoid its consequence."

It is estimated that about 2,000 applications for such certificates of discharge as are authorized by the law have been filed in this office, being an average of about 300 applications per year.

In some few instances it has been evident that the name under which the soldier entered the service was assumed for the purpose of covering a crime, generally that of desertion from a previous enlistment, but in a large majority of cases the applicants have been those who enlisted during their minority, assuming the names under which they enlisted for the purpose of concealing their identity from their parents or guardians. A considerable number of the applicants, however, are ex-slaves who entered the service under the names of their masters, the name of the master having been assumed for the purpose of enlistment, the man having properly no surname of his own. In some such cases, after the enlistment contract was terminated, the soldier resumed, or assumed, the name by which his father was known and by which he himself continues to be recognized. Such cases have been construed as coming within the provisions of the law, and the authorized relief has been extended. In a very large majority of the cases presented it has been satisfactorily established that the name under which service was rendered was not assumed for the purpose of concealing a criminal act on the part of the applicant. In all cases in which a certificate of discharge is given under the act the surrender of the original discharge certificate is required, or, in lieu thereof, the presentation of evidence of its loss or destruction.

CERTIFICATES IN LIEU OF LOST DISCHARGES.

[Act of March 3, 1873.]

An act of Congress approved March 3, 1873, authorized the Secretary of War to furnish duplicate certificates of discharge to such noncommissioned officers and privates in service during the war of the rebellion as had lost their original discharge certificates, and the Army Regulations then in force, which prohibited the issue of duplicate discharges, were modified accordingly. It has been found impossible to literally comply with the provisions of this act, as an exact duplicate of a lost original certificate of discharge can not be furnished, original discharge certificates not having been copied or otherwise recorded in full at the time of their issue. But a form of certificate of service and discharge has been adopted which is a near approach to the form of discharge certificate in use during the war, and the issue of this certificate in lieu of a lost discharge is a practical compliance with the requirements of the law. Many thousands of the certificates have been issued since the enactment of the law, and there appears to be no diminution in the number of applications therefor, 5,157 such applications having been received and acted upon during the last fiscal year.

INDEX-RECORD CARD WORK.

The work of reproducing the military and medical records of officers and enlisted men of the volunteer forces has been fully described in previous reports from this office. The object of the work at the outset was to preserve the dilapidated and rapidly decaying records of the war of the rebellion from utter destruction and to reproduce their contents in such form that the information they contain might be easily accessible, and that the most comprehensive and satisfactory reports might be made therefrom with the least possible expenditure of time and labor. The system which was adopted after some experimentation is the one now known as the index-record card system. This system, which is believed to have had its origin in the experiments referred to, at least in so far as the system has been applied to the records of a public office, consists in the reproduction on a separate index-record card of every item of information found of record in regard to any individual officer or enlisted man in any one of the official records, and the filing of these cards in an individual envelope or card jacket in proper logical and chronological order, thus bringing together in one place the complete military or medical history of each officer and enlisted man in small compass and in such form that its contents can readily and with little labor be reproduced in the preparation of reports to the officials of the Government by whom they are required in the settlement of claims, or for any other purpose for which they may be required.

The card jackets being filed together in alphabetical or dictionary order, by regimental organizations, the jacket of any individual is readily discovered and his record easily reproduced, with the certainty that the record embraces every item of information that the archives afford relative to his military career, wherever these items of information may have been originally recorded and however obscure or incidental the original record may have been.

This, in brief, is the index-record card system, which has been explained in detail in former reports. It will be at once observed that this system permits the filing away of the original mutilated records, to be referred to only in the very rare cases in which a reference to the original records is required, thus securing them from the total destruction with which they were threatened.

The carding of the medical records was begun in 1887 and was practically completed in 1890, when the work of carding the military records was commenced, with the result that by the close of the fiscal year ended June 30, 1894, all of the volunteer organization rolls of the war of the rebellion had been carded, besides numerous miscellaneous records, thus placing the original records of service in that war beyond the danger of destruction.

By an act of Congress approved July 27, 1892, it was provided that the "military records of the American Revolution and of the war of 1812," then "preserved in the Interior and Treasury Departments," should be transferred to the War Department, to be "preserved in the Record and Pension Division [Office] of that Department," and that they should be "properly indexed and arranged for use;" and by an act approved August 18, 1894, it was further provided that "all military records, such as muster and pay rolls, orders, and reports relating to the personnel or the operations of the armies of the Revolutionary war and of the war of eighteen hundred and twelve," then filed in any of the Executive Departments, should be transferred to the War Department, "to be preserved, indexed, and prepared for publication."

As a result of this legislation a large mass of records has been received

from the State, Treasury, and Interior Departments, and of these records the organization rolls of the Revolutionary war and the war of 1812 have been reproduced by the index-record card system previously adopted for the records of the war of the rebellion.

The work of carding the regimental returns and the miscellaneous records of the war of the rebellion was interrupted and greatly retarded by the diversion of the labor of the clerical force from those records to the records of the earlier wars and those of the various Indian wars in which the country has been engaged, which latter have also been included in the index-record card system.

During the last fiscal year and up to the present date such portion of the clerical force as could be spared from the current work of the office has been constantly engaged in the work of carding the records, work having been continued on the regimental returns of the war of the rebellion, the records of the war of 1812, and those of the Revolutionary war, the latter including a quantity of valuable original records loaned by the State of New York to supplement those of that State previously received from other sources.

The work for the fiscal year included the preparation of 1,329,955 military cards and 2,152 medical cards, which, added to the number previously reported, make a total of 39,578,281 of the former and 6,961,596 of the latter class, aggregating 46,539,877 index-record cards prepared up to and including June 30, 1897.

The present condition of the work of reproducing the individual records of the officers and enlisted men of the volunteer forces and those of the Continental forces of the Revolutionary war is that, with the exception of some few organizations in service during the Indian wars, all of the organization rolls of all of the wars in which the country has been engaged from the Revolutionary war to and including the war of the rebellion have been carded, and very considerable progress has been made in the work of arranging, classifying, and carding the miscellaneous records containing evidence of individual military service. The work on the latter class of records is necessarily tedious and slow, requiring great care and consideration, but it is of the utmost importance that all records bearing evidence of the service of individual officers and enlisted men not already reproduced shall be included in the index-record card system. This is especially the case with regard to the Revolutionary war, the only evidence of service in that war being, in many instances, the personal mention found in the miscellaneous and fragmentary records now in process of reproduction.

It is to be remarked that the collection of Revolutionary war records filed in this office is far from complete, and that there is no complete collection of such records anywhere in existence. It is hoped, however, that the War Department collection will be largely augmented by the loan of such Revolutionary records as are now in the custody of the authorities of the several States and of historical societies, in order that they may be copied and included in the general system of index-record cards. Such records have been loaned by the States of Vermont, New Hampshire, and New York, and the originals, after having been copied, have been returned to their former custodians. It is expected that this example will be followed by the authorities of other States and by the historical societies having such collections, and that the collection of this Department will thus be made as nearly complete as it is possible to make it after the long lapse of time since the Revolutionary armies were disbanded.

The question of the publication of the records of the Revolutionary

war and the war of 1812, as contemplated by the act of Congress approved August 18, 1894, is one that is frequently brought to the attention of this office by representatives of the various patriotic societies, and by other persons interested in the proposed publication. It will be observed that the act of Congress referred to, which is quoted in a preceding paragraph, does not specifically authorize the publication of the records, but provides only that, besides their transfer to the War Department for preservation, they shall be "indexed and prepared for publication." Congress will doubtless make the necessary appropriation for the publication of these records at the proper time, but it is clearly not advisable to undertake the publication of any portion of them, especially of those relating to the individual histories of officers and enlisted men, until the compilation shall have been completed and every available source of information exhausted. It will readily be seen that there are many difficulties in the way of obtaining missing records or copies of them, and that progress in this direction must necessarily be slow, but it is hoped that this part of the work will be expedited by the efforts of the various societies and persons interested in the subject, by urging upon the authorities of the States in which they are located, or upon historical societies or individuals having Revolutionary records in their possession, the importance of loaning such records to this Department in order that they may be copied. It would seem that there should be no objection on the part of the custodians of the records to loaning them to the War Department for this purpose, when it is known that the Department guarantees their prompt and safe return and pays all charges for their transportation.

TRANSCRIPTS OF MILITARY RECORDS.

For some years after the close of the war of the rebellion it was the practice of the War Department, when it could conveniently be done, to furnish to the adjutants-general of States copies of the rolls of organizations, or the individual records of officers and enlisted men, from their respective States, for the purpose of completing the State records of service. But these requests became so numerous, and called for the expenditure of so much time and labor, that it was found impossible to comply with them without serious interference with much more important current work, and the practice was then inaugurated of permitting clerks of the Department to do work of this character after office hours, and to receive compensation therefor from the States for which the work was done. The practice of permitting the clerks to render such service was, however, found to be so demoralizing in its effects, both upon the clerks and upon the public service, that it was finally abolished by the Secretary of War in 1889, and it has never since been revived, although numerous and urgent requests for its revival have been received from various sources.

For a short time after the practice of permitting clerks of the Department to work after office hours for a compensation to be paid by the States was abolished, an effort was made to compile, during office hours, and without charge, the data which several of the States desired; but it was soon found that requests for such data were increasing very rapidly, and it became evident that the Department must either neglect its own legitimate business or must abandon the effort to meet the demands of the States. The latter course was adopted, and on February 17, 1892, the Secretary of War, after carefully considering the subject in all its bearings, issued an order prohibiting the furnishing

of information from the records of the personnel of the volunteer armies to be used for historical purposes or to complete the records of States.

The rule laid down in the order cited above has been rigidly adhered to and enforced, except in the very few instances in which a departure therefrom was required by the act approved March 2, 1895, making appropriations for the legislative, executive, and judicial expenses of the Government for the ensuing fiscal year. The section of that act relating to the Record and Pension Office of the War Department contains the following provision:

> The Secretary of War shall, upon the application of the governor of any State, furnish to such governor a transcript of the military history of any regiment or company of his State, under such regulations as the Secretary of War may prescribe, at the expense of such State.

Pursuant to this enactment, regulations in execution of its provisions were prescribed by the Secretary of War, which have been quoted in a previous annual report. By reason, however, of their importance, not only in connection with the legislation to which they relate, but also in their general application to the important subject of the furnishing of transcripts of, and information from, the official records, it is believed that these regulations may be properly reproduced in this report. The regulations are in the form of a War Department order, of which the following is a copy:

ORDERS.

WAR DEPARTMENT,
Washington, D. C., April 4, 1895.

The act, approved March 2, 1895, making appropriations for the legislative, executive, and judicial expenses of the Government for the fiscal year ending June 30, 1896, and for other purposes, provides, in the section relating to the Record and Pension Office of the War Department, that the Secretary of War shall, upon the application of the governor of any State, furnish to such governor a transcript of the military history of any regiment or company of his State, under such regulations as the Secretary of War may prescribe, at the expense of the State. Under this provision of law transcripts of the military records of organizations credited to the several States will be furnished to the governors of the States to which such organizations were credited, upon the request of the governors and at the expense of the States, under the following regulations:

All applications for transcripts of records under this law should be made over the signatures of the governors of the States in interest, should be addressed to the Secretary of War, and should designate specifically the records of which transcripts are desired.

Upon the receipt of such an application from the governor of any State he will be furnished with an estimate of the cost of making the transcripts specified in his application, and will be notified that funds sufficient to cover the estimated cost should be deposited with the disbursing clerk of the War Department. No work of this character will be undertaken until an amount sufficient to cover its probable cost shall have been deposited with the disbursing clerk and he shall have certified that fact to the Chief of the Record and Pension Office.

If it is found upon completion of the work in any case that the amount deposited is in excess of the actual cost of the work, the amount in excess will be returned to the person making the deposit. Whenever it is found as work progresses that the amount deposited is insufficient to cover the cost of the whole work the governor of the State in interest will be notified to that effect, and will be furnished with an estimate of the amount necessary to complete the work. In every case work will be suspended before its cost shall have exceeded the amount deposited to meet it.

All transcription of records under the provisions of the law cited above will be done during office hours by the regularly authorized employees of this Department, under the direction of the Chief of the Record and Pension Office, who will keep a record of the time of persons employed on the work and of the cost of materials used therein, and will furnish the disbursing clerk of the Department with a statement of the cost of both labor and materials to the Government. The amount of such cost will then be covered into the Treasury by the disbursing clerk out of the funds deposited with him by the State in interest to defray the expense of the work.

The transcripts which will be furnished will be literal copies of the military records of regiments, companies, troops, and batteries. No compilation, consolidation or summarizing of records will be undertaken, and no copies of records other than those herein specified will be furnished.

Items of information relative to individual officers and enlisted men, except as such items may be included in the copies of regimental, company, troop, or battery records hereinbefore provided for, will not be furnished to complete the records of States or of regimental or other associations. Not more than one copy of any record will be furnished to any State.

Persons not in the employ of and under the legal control of the War Department will not be allowed to copy or have access to any of the records filed in the Record and Pension Office.

In view of the fact that provision has been made by law so that any State can obtain transcripts of the original records of the organizations credited to it, and because the dilapidated condition of the rolls and other records of the volunteer armies, caused by the constant handling to which they have been subjected during the past thirty years, makes it necessary that a strict rule for their preservation shall be adopted and that they shall be referred to only when reference to them is absolutely necessary, and, because, further, of the limited clerical force and the demands made upon it by the current work of the Department, it is hereby ordered that hereafter no copies of records pertaining to military organizations credited to the several States shall be furnished except to the governors of States, as hereinbefore provided, or as otherwise specifically required by law.

DANIEL S. LAMONT,
Secretary of War.

It will be observed that the act of Congress upon which the foregoing order is based directs the Secretary of War to furnish to the governor of any State "a transcript of the military history of any regiment or company of his State," but the law does not direct or authorize the furnishing of items of information relative to particular officers and enlisted men, and hence the regulations adopted by the Secretary of War prescribe that the transcripts which shall be furnished under the law in question shall be literal copies of the military records of regiments, companies, troops, and batteries; that no compilation, consolidation, or summarizing of records shall be undertaken; and that items of information relative to individual officers and enlisted men, except as such items may be included in the copies provided for in the order, shall not be furnished.

But few applications have been received for transcripts of the military records under the law. It is evident that the State legislatures are unwilling to appropriate the money necessary to obtain such transcripts, and there is reason to believe that in most of the few instances in which application has been made it has been done in the interest of private individuals, and that the expense has been borne by them and not by the States.

PUBLICATION OF PERSONAL MILITARY RECORDS, WAR OF THE REBELLION.

The avowed object of many of the States in compiling their records was to publish them, and it is a singular fact that the War Department, while always strenuously insisting that its records of individual officers and enlisted men are of a confidential nature and can not safely be made public, has not only interposed no objection to the publication of the records by the States but has aided such publication by furnishing transcripts of its own records therefor. Many, if not all, of the States to the compilation of whose records the War Department has contributed have published so-called "rosters," all of which are necessarily incomplete and many of which are inaccurate and misleading.

Under the liberal laws enacted by Congress for the benefit of ex-soldiers and their heirs the chances of imposition and fraud upon the Government are greatly increased. It is evident, therefore, that stringent rules should be maintained to prevent the use of the informa-

tion afforded by the records, except in such a way that, while claimants shall be given the greatest possible benefit of everything pertaining to their claims, the door shall not be opened needlessly to the perpetration of fraud. Moreover, the records contain much that is of a purely personal character and, while of no interest to the general public unless improperly used, is capable of being made the source of serious annoyance to the persons to whom it relates, and of alienating the confidence of employers and the good will and esteem of neighbors.

For the reasons stated, it is believed that the War Department should not go beyond the plain requirements of law in aiding or encouraging the States to publish the records of volunteer officers and enlisted men of the late war. The time has not yet come when a general publication of these records can be permitted without endangering the interests of the Government. When that day arrives, the Government should, and undoubtedly will, publish them in a far more accurate and satisfactory form than that in which any State or association of private individuals can possibly publish them. State or private publications of this character are always necessarily incomplete, and often misleading, and can never be confidently relied upon for the determination of any important matter. No complete and accurate history of the personnel of the Volunteer Army can be prepared by anyone until the War Department shall have finished the compilation of all the records in its custody, and these records comprise not only the regimental and company records of which the States may have or may obtain copies, but they also include a great collection of other very important records, such as those of brigades, divisions, corps, armies, departments, hospitals, prisons, posts, camps, and detachments, copies of which have never been furnished to the States, and can not be furnished to them under any existing law.

There is no necessity for the publication of these records by the States, because the War Department always promptly furnishes the military history of officers and enlisted men to the proper officials of the United States, of any State, relief association, or society when it is shown that such history is to be used for legitimate purposes, either in the adjudication of pending claims or to determine the eligibility of applicants for membership in the various societies of ex-soldiers or their descendants. There is no doubt that many persons who are interested in the prosecution of claims against the Government are clamorous for the immediate publication of these records, but this fact is of itself a strong argument against the proposition.

ACCESS TO THE RECORDS.

It has been frequently urged upon the Department that persons employed by the States should be permitted to have access to the records and to extract from them such information as may be desired; and the extension of this privilege to historians, biographers, and other persons engaged in literary pursuits, or their agents, and even to claimants and attorneys for persons having claims against the Government, has been persistently demanded. There seems to be an impression abroad, especially among attorneys and claim agents, that the official records are public property, to which general and indiscriminate access should be permitted, and it has been found difficult or impossible in many instances to convince interested persons that they have not the right to inspect the records at will and to make such extracts and transcripts as may suit their interests or caprice.

To all such applications, those of State officials as well as those of persons of no official station, the Department has been compelled to apply the well-established rule that access to the records must be denied to all persons not officially connected with the Department and legally under its control. To subject the dilapidated original records to the handling of unskilled and inexperienced persons would expose them to the danger of total destruction, and both the original rolls and returns and the index-record cards would be liable to be misplaced in the files to which they pertain, or to be misfiled altogether, and so lost to the records. For this reason, even clerks of the Department who have not been specially trained to the use of the original rolls and returns and of the record cards are not permitted to have access to them. But the danger of the destruction and loss of the records is not the only reason for the existence and maintenance of the present rule. To relax it would deprive the Government of the protection afforded by the records in the detection of fraudulent claims and would afford every facility for their preparation and successful prosecution. Moreover, as before stated, many of the records are of a confidential nature, and can be made the source of serious detriment or annoyance to the persons to whom they relate. The reputations of the living and the dead are dependent upon the safeguards that are thrown about these records, and for this reason alone, if for no other, it would be unwise to allow access to them by persons not legally responsible to the Department for their proper use.

FURNISHING INFORMATION FROM THE RECORDS.

The question of furnishing information from the records of the volunteer armies is an important one and one that is little understood by the general public. Among the requests for information and their objects may be mentioned, (1) requests from United States officials, with a view to the adjudication of claims against the United States; (2) from State officials and relief associations for use in the settlement of State and local claims; (3) from the managers of the different national and State homes and asylums for ex-soldiers and their descendants, to determine the eligibility of applicants for admission and to complete the records of such institutions; (4) from representatives of the various patriotic societies composed of ex-soldiers and their descendants and to determine the status of persons applying for membership; (5) from State officials, to complete State records of service and for publication; (6) from societies and associations and from individuals for historical, genealogical, biographical, memorial, and statistical purposes; (7) from associations and individuals, evidently for the purpose of gratifying personal or political spite or malice or to influence the results of a political campaign; (8) from individuals, to determine their eligibility for membership in societies or for admission to asylums for the destitute, to gratify curiosity and to determine wagers; (9) from actual or prospective claimants and their attorneys, to aid in the preparation or prosecution of claims against the national or State governments or against a State or local relief association.

These are among the many and diversified requests received at this office for information from the official records. Many of them are laudable or unobjectionable, while many others are for purposes for which it would be highly improper to furnish the information desired.

The exercise of great care and constant vigilance is required to prevent the use of the information the records afford to the detriment

either of the Government or of individuals. The reasons for this protection of public and private interests are partially set forth in previous portions of this report. While much that the records contain may safely be made public, there is much that is of a confidential nature, and much also that, although not confidential in its character, can not safely be communicated to persons contemplating the preparation of claims against the Government or who have claims pending in any of the several Government departments. The Department always promptly furnishes the military histories of officers and enlisted men to the proper officials of the Government, or of any State, relief association, or society, when it is shown that such histories are to be used for legitimate purposes, and claimants and other interested persons thus obtain the full benefit of all the information the records afford, while the interests of the public are not left unprotected. Furthermore, the clerical force allowed by law is not sufficient to satisfy all of the numerous demands made upon it for information from the records, and any attempt to meet these demands would seriously interfere with much more important current work of the Department.

The dilapidated condition of the original records, caused by the constant handling to which they have been subjected for many years, is another reason why they should be carefully guarded, and in 1892 an order was issued by the Secretary of War directing that they should be referred to only when necessary to the transaction of the official business of the Government. The substance of that order was repeated in an order dated April 4, 1895, which has already been quoted in this report, and in February of the present year still another order was issued by the Secretary of War on the subject of furnishing information from the records of the volunteer armies, giving somewhat in detail the rules adopted relative thereto and the reasons for their adoption. Following is a copy of the order, which is believed to be of sufficient importance to justify its insertion in full in this report:

ORDERS. WAR DEPARTMENT,
Washington, D. C., February 23, 1897.

The muster rolls and other records of individual officers, enlisted men, and organizations, which are on file in the Record and Pension Office of this Department and which pertain to the war of the rebellion, the Mexican war, the various Indian wars, the war of 1812, and the war of the Revolution, have become so dilapidated through years of constant handling, or other causes, that it has been found necessary to adopt stringent measures for their preservation, and to restrict reference to them to cases in which such reference is absolutely necessary. Many of the most important of those records have been reproduced by the index-record card system, but the handling of these cards, as well as the original records which they represent, by persons not thoroughly instructed in their use and not under the control of this Department, involves great danger of the loss, through misfiling or otherwise, of cards or other records which can not be replaced. For these reasons, as well as for others equally cogent, the Department is compelled to restrict access, both to the original records and the index-record cards, exclusively to persons who are in the employ of the Department and are lawfully subject to its control.

The Department will furnish at any time such information relative to any individual officer or enlisted man as its records afford, and as may be actually necessary to enable the proper officials of any State, or any relief association, patriotic society or other kindred organization, to pass upon any application that may have been made in good faith for aid, relief, or membership, and that may properly come within the jurisdiction of such officials or organization. But requests for information relative to individual officers or enlisted men, or for the compilation of statistical or other data relative to particular organizations, to be used for historical or memorial purposes or for publication, can not be entertained, because the limited clerical force allowed by law is insufficient to enable the Department to comply with such requests without serious interference with more important current work.

The records of general historical value pertaining to the late war have either been published, or soon will be published, in the "Official Records of the Union and Confederate Armies," so as to render them accessible to all who may be interested in them. Should Congress provide in future for a similar publication of the records

relating especially to individual officers, enlisted men, and organizations of that war and prior wars, the historical data which those records contain will also become available for general use. But until such publication shall have been authorized, or other legislation enacted, it will be impracticable for the Department to furnish compilations or statements from those records for historical, memorial, or statistical purposes, or for publication.

For the reasons set forth above, the following rules have been adopted relative to the subject of furnishing statements or extracts from the records of the personnel of the volunteer armies and other similar records on file in the Record and Pension Office of this Department, and are hereby announced for the information and guidance of all concerned:

1. All requests, made by persons other than officials of the United States, for information from the official records must, to receive favorable consideration, set forth the specific purpose for which they are made, and must be sufficiently in detail to enable this Department to determine for itself how much, if any, of the information asked for is necessary for the purpose indicated and can properly be furnished.

2. Any such request that may be made with a view to determining the merits of an application for State or other aid or relief must be made, over his own signature, by the State or other official who may be authorized by law to decide whether such aid or relief shall be furnished; or, in case the decision rests with a board, commission, or association, the request must be made, over his or her own signature, by the chief officer of the board or other organization which is empowered to decide the case. All such requests must, to receive favorable consideration, meet the following requirements:

(*a*) The character of the relief or aid for which application has been made must be fully and specifically set forth.

(*b*) If the application is to be decided under a law of any State, that law must be definitely cited.

(*c*) If the application is pending before any board or association, not created by or acting under any law, the source from which such board or association derives its authority to act must be stated.

(*d*) If the pending application is that of some person other than the one whose record is desired, the relationship of the applicant to the person whose record is desired must be set forth.

(*e*) The full name of the person whose record is requested, the rank held by him, and the designation of the organization in which it is claimed that he served, must invariably be stated.

3. Any request that may be made for the purpose of enabling a society or association to decide as to the eligibility or noneligibility of an applicant for admission thereto must be made by the chief officer, over his or her own signature, of that branch of the society or association in which the application is to be voted upon or otherwise decided, and must meet the following requirements:

(*a*) The title or designation and the location of the branch to which the application for membership has been made must be given.

(*b*) The full name and residence of the applicant, and the date on which the application was made, must be stated.

(*c*) The relationship of the applicant to the person whose record is desired, if the application for membership was not made by such person himself, must be set forth.

(*d*) If the record of any other person has been requested of or furnished by the War Department in connection with the pending application, a statement to that effect, including the name of the person whose record has been requested or furnished, must be made.

(*e*) The full name and rank of the person whose record is desired and the designation of the company and regiment, if any, in which he served, must be invariably stated in all cases in which service during the war of the rebellion is claimed.

(*f*) The full name of the person whose record is desired, and the State from which he entered service or of which he was a resident at the time of his entry into service, must be invariably stated in all cases in which service during the Revolution or the war of 1812 is claimed. His rank and the designation of the organization in which he served, if known, should also be stated.

(*g*) Requests for the record of a man whose surname only is known, or for information relative to all the men bearing a certain name, will not be entertained.

4. Requests emanating from a post or other subsidiary organization of the Grand Army of the Republic must be forwarded through, and must be authenticated by the signature of, the department commander. Requests emanating from the subdivisions of other associations founded on military service during the war of the rebellion must be forwarded and authenticated as follows: Union Veterans' Union, through department commanders; Union Veteran Legion, through the national commander; Sons of Veterans, through division commanders.

5. The information that will be furnished for use in connection with any application for membership in any society or association, or for State or other aid or relief, will be strictly limited to that which is actually necessary to enable a decision upon

the pending application to be made, and will in no case comprise items that may be desired for any other purpose, such as to complete the records of a society, to make some other and different application, or to be used in the prosecution of a claim against the United States.

6. Concise statements of the military histories, so far as shown by the records on file, of men who served in the Revolution or in the war of 1812, will be furnished upon the application of descendants of those men, under the following conditions:

(*a*) The relationship of the applicant to each person whose record is desired must be stated.

(*b*) The full Christian name, as well as the surname of such person, must invariably be given, and the rank which he held and the designation of the organization in which he served, if those are known, must be stated.

(*c*) The place, or at least the State, from which he entered service, or of which he was a resident at the time of his entry into service, must be designated.

(*d*) If the name of the person whose record is desired is a common one, the designation of the organization in which he served, or the names of some of the regimental officers under whom he served, must be stated.

(*e*) Requests for information relative to all the men bearing a certain name will not be entertained, nor will any other request involving an unreasonable expenditure of time and labor be considered.

(*f*) There will not be furnished to or for any one descendant the record of service of more than two ancestors in the Revolution, or of more than two in the war of 1812.

7. Each request for the record of an officer or enlisted man of any war should be made on a separate sheet of paper, should be complete in itself, and should fully meet all the requirements of this order. In no case should requests for the records of two or more men be combined in one communication.

8. Compilations or statements relative to individual officers, enlisted men, or organizations will not be furnished from the records on file in the Record and Pension Office for historical, memorial, or statistical purposes, or for publication, or to complete the records of States, societies, or associations.

9. Because of the great danger of the destruction, loss, or misfiling, through handling by inexperienced persons or those not under the control of this Department, of the muster rolls and other regimental or company records, index-record cards, and all other similar records, which are on file in the Record and Pension Office, and which pertain wholly or chiefly to the personnel of the armies of the various wars, the handling of those records will be restricted exclusively to the specially trained employees of that office, and no information will be furnished from them except as hereinbefore provided, or as may be otherwise required by law.

DANIEL S. LAMONT,
Secretary of War.

CLERICAL FORCE.

The reproduction of the records of personal military service by the index-record card system, which system has been briefly explained in this report, and the application of that system to the current correspondence records, as fully illustrated in former reports, have resulted, as was anticipated, in a great saving of time and labor in the preparation of individual military histories and in the transaction of the general business of the office. By the adoption of these and other improved methods of business it has been found possible to materially reduce the clerical force without interfering with the prompt dispatch of the current business, while still maintaining a sufficient force for the continuance of the work of transcribing the records of the volunteer armies; and upon the recommendation of the chief of the office a reduction of 25 was made in the clerical force in the appropriation for the present fiscal year, making a total reduction of 375 clerks since the organization of the Record and Pension Office, representing a permanent annual saving of $425,000 in salaries alone.

In all of the reductions that have been made in the clerical force of the office the selections for discharge were based strictly upon the efficiency records of the clerks, a liberal allowance being made in the ratings on account of honorable military or naval service. No ex-Union soldier or sailor has ever been reduced in grade or discharged in this office except for serious misconduct on his part, or because he was so

inefficient that he could not be retained without great detriment to the public service, or, in case of a reduction of the clerical force, without unjustly discharging a much more efficient and deserving clerk.

In 1893, 30 per cent of the total force of the office was composed of veterans; but on July 1, 1897, after all the reductions referred to above had been made, 36 per cent, or considerably more than one-third of the total force of the office, was composed of veterans, being a higher percentage than that in all the other bureaus and offices of the Department combined. Of the higher-grade clerkships, at $1,800 and $1,600, allowed to the office by existing law, 81 per cent of the former and 65 per cent of the latter are filled with veterans. In the lower grades, at $1,400, $1,200, and $1,000, the percentages of veterans are, respectively, 40, 20, and 54. It is natural that the percentage of veterans should be smaller in the lower grades than in the higher, because of the large number of young men who have come into the office in recent years under civil-service laws and through certification by the Civil Service Commission.

An efficiency record of all clerks has been carefully kept and reported under the direction of an efficiency board, which was organized under an order of the Secretary of War of March 2, 1892, issued in accordance with instructions from the President, for the purpose of placing promotions wholly upon the basis of merit. This board, which is composed of eight of the principal clerks of the office, has always been left entirely free to reach its own conclusions, uninfluenced, directly or indirectly, either by the Secretary of War, the chief of the office, or any other person in authority over it, except that it has invariably been strictly charged to give great weight, when called upon to make recommendations for discharge, to a record of honorable military or naval service, or of long and faithful service in the Department, in favor of any clerk having such a record. The board prepares a list semi-annually, which is based upon the records of work, attendance, and conduct for the previous six months, and which shows the relative standing of all employees, each of whom is officially informed as to his rating and relative standing as soon as the list is completed. This efficiency list is invariably followed by the chief of the office in making his recommendations for promotion, and every clerk knows that whenever, by the faithful and efficient performance of his duty, he shall have made a record that places him first in his grade upon the efficiency list his name will surely be presented to the Secretary of War for the first promotion to be made thereafter.

From the organization of the Record and Pension Office, in 1889, up to the present time, no clerk of the office has ever been discharged or reduced in grade for political reasons, or to make room for the appointment or promotion of any other person. Demonstrated merit, and that alone, has always been sufficient to insure the retention of a clerk in his grade, and nothing but the well-proven lack of merit has ever led to the reduction or discharge of any clerk. It is known that allegations to the contrary are not infrequently made by or in the interest of certain ex-employees of the office, who seek relief from the results of their own wrongdoing or incompetency by appealing for restoration to the service; but all such allegations are baseless, and, no matter by whom made, are unworthy of serious consideration.

Very respectfully,

F. C. AINSWORTH,
Colonel, U. S. Army, Chief of Office.

The SECRETARY OF WAR.

REPORT OF THE BOARD OF PUBLICATION OF WAR RECORDS.

REPORT

OF

BOARD OF PUBLICATION OF WAR RECORDS.

WAR DEPARTMENT, WAR RECORDS OFFICE,
Washington, October 9, 1897.

SIR: The Board of Publication of the Official Records of the Rebellion respectfully submits the following report of its operations during the fiscal year ending June 30, 1897:

Eleven thousand copies each of Vols. XLVIII, Part II; XLIX, Parts I and II, and L, Parts I and II, were printed and distributed during the year.

Supplemental Vols. LI, in two parts, LII, in two parts, and LIII were put in type during the year. These five volumes are made up of official records that came into the possession of the Department subsequent to the publication of the volumes in which the records would have appeared had they been then accessible.

When these supplemental volumes shall have been distributed, as they will be in a few months, the public will be in possession of the whole first series of printed records, consisting of all the official reports and correspondence relating to battles and campaigns of the war of the rebellion in possession of the Department or that have been obtained from private sources and that are thought to be historically valuable. The number of serial volumes is 111, containing an aggregate of 118,216 octavo pages.

A general index, in two volumes, of all the matter embraced in these books and in the Atlas is well advanced and will probably be published about the close of the present fiscal year.

The work of selection of matter for Series II, III, and IV, and its compilation, have continued during the year, and several volumes of each series are ready for publication. The present estimate of the bulk of records remaining unpublished is: Series II, 8 books; Series III, 8 books; Series IV, 4 books; total, 20 books.

The following notes of work accomplished in the several departments of publication may be of interest:

Received from the printing office, 45,170 volumes of records; distributed and sold, 43,658 volumes of records; received from printer, 14,394 parts of Atlas; distributed and sold, 19,118 parts of Atlas; letters to the number of upward of 2,000 respecting distribution were received and answered; 3,264 letters, cards, and circulars respecting the work were sent out; 65,000 address labels were prepared and verified.

The sales of the work during the year covered 1,675 volumes of records and 940 parts of Atlas, and the proceeds, amounting to $1,954.74, were deposited in the Treasury as required by law. The sum of $1,151 was received from subscribers for binding. This sum was paid to the Public Printer upon bills rendered for binding the Records and Atlas.

The act of June 4, 1897, to provide for the sundry civil expenses of the Government, provided for the supply by the Secretary of War to each Senator, Representative, and Delegate of the Fifty-fourth Congress, who was not then receiving the publication, a complete set of the War Records; and the incomplete and unclaimed sets on hand in the Department were made available for this purpose. In order to carry out this provision it became necessary to have a limited edition reprinted from the electrotype plates of certain volumes and maps, as the number on hand in the Department was inadequate to make up the 200 sets that were needed to supply those Senators, Representatives, and Delegates who had not previously received the Records. The cost of these reprints will be defrayed from the appropriation for the last fiscal year. Delivery of the books will be made as soon as the binding can be completed by the Public Printer.

The number of surplus volumes on hand on June 30, 1897, consisting of broken sets, uncalled for by the beneficiaries for whom they were intended, and including in this category such as still remain of the 700 sets that were set aside for sale by the act of August 7, 1882, numbered 57,875. Sales are continued under the law just cited, but there can be no general distribution of the surplus volumes save by authority of Congress.

The financial exhibit for the Rebellion Records publication from the beginning of the work is as follows:

Appropriations from commencement of the work in 1874, including fiscal year 1896		$2,334,328.50
Expended of above:		
Salaries, contingent and miscellaneous		1,184,291.02
Printing and binding		1,134,447.50
Covered into the Treasury		15,589.98
Total		2,334,328.50
Appropriated for fiscal year 1897:		
Legislative act		15,380.00
Sundry civil act		145,000.00
Total		160,380.00
Expended of above:		
Salaries	$77,262.22	
Printing and binding	53,681.05	
Total		130,943.27
Balance on hand		29,436.73
Outstanding obligations, estimated		21,176.28

The total number of persons connected with the publication at the present time is:

Army officers	4
Civilian employees	60

The expenditures for the past eight years have been as shown in the following table:

Year.	For salaries and services.	For printing and binding.	For miscellaneous.	Year.	For salaries and services.	For printing and binding.	For miscellaneous.
1890	$32,962.41	$93,332.81	Not stated.	1894	$117,041.12	$82,769.24	$6,334.06
1891	68,149.42	186,980.20	9,539.33	1895	96,909.78	88,051.08	3,808.02
1892	85,262.52	163,595.04	17,403.97	1896	72,795.55	83,108.14	3,433.92
1893	106,726.69	151,747.23	7,662.18	1897	72,585.00	53,681.05	4,677.22

The appropriations for the current fiscal year are:

Legislative bill		$15,380.00
Sundry civil bill		115,000.00
Total		130,380.00
Of this sum it is estimated that for present civil force the expenditures for services will be	$77,765.53	
Miscellaneous	2,653.32	
Total		80,418.85
Leaving for printing and binding		49,961.15

Respectfully submitted.

GEO. W. DAVIS, *Major, U. S. A.*,
LESLIE J. PERRY, *Civilian Expert*,
J. W. KIRKLEY, *Civilian Expert*,
Board of Publication.

The SECRETARY OF WAR.

REPORT OF THE BOARD OF COMMISSIONERS OF THE SOLDIERS' HOME.

WAR DEPARTMENT,
ADJUTANT-GENERAL'S OFFICE,
Washington, December 2, 1897.

Under section 1 of the act of Congress approved March 3, 1883, prescribing regulations for the Soldiers' Home in the District of Columbia, the accompanying reports of the Board of Commissioners of the Soldiers' Home, District of Columbia, and of the Inspector-General of the Army are published, and a copy of this order will "be deposited in each garrison and post library," as required by the act mentioned.

By order of the Secretary of War.

SAM'L BRECK,
Adjutant-General.

REPORT

OF THE

BOARD OF COMMISSIONERS OF THE SOLDIERS' HOME.

THE SOLDIERS' HOME,
OFFICE OF THE BOARD OF COMMISSIONERS,
Washington, D. C., October 16, 1897.

SIR: Under the requirements of section 1 of the act of Congress approved March 3, 1883, prescribing regulations for the Soldiers' Home in the District of Columbia, I have the honor to submit the following report of the Board of Commissioners of the Soldiers' Home for the year ended September 30, 1897.

The changes in the number of the beneficiaries during the year are shown in the following table:

	Regular.	Temporary.	Total.
On the rolls September 30, 1896	1,017	81	1,098
Admitted since	179	217	396
Readmitted since	107	.....	107
Total	1,303	298	1,601
Withdrawn from the Home	152	.....	152
Dropped, dismissed, etc	65	129	194
Died	48	6	54
Transferred to permanent roll	.....	60	60
Total	265	195	460
Leaving on rolls September 30, 1897	1,038	103	1,141

This shows an increase of 43 beneficiaries since the last annual report.

The number (1,141) on the rolls September 30, 1897, is accounted for as follows:

Present at the Home, 724, an increase of 37 over last year; on out-door relief, 342, an increase of 16; in the Government Hospital for the Insane, 18; on furlough, 56, and 1 absent sick.

The daily average number of inmates during the year was 724. Last year the average was 685.

The total number of deaths was 54, a decrease of 13 from last year. Of these 30 died at the Home, 15 on out-door relief, 2 on furlough, 2 near the Home, 1 in the Government Hospital for the Insane, and 4 committed suicide.

During the year temporary relief was given to destitute discharged soldiers who were not entitled to admission to the extent of 12,647 meals, and 227 were provided with lodgings for a few nights each.

The following statement shows the amounts received and expended during the year, and the amount of the permanent fund of the Home deposited in the United States Treasury:

PERMANENT FUND.

Balance in the United States Treasury October 1, 1896		$2,711,124.52
Settlement by Treasury Department for the current year	$134,256.23	
Amount withdrawn for current expenses	107,782.80	
		26,473.43
Balance in the United States Treasury September 30, 1897		2,737,597.95

ACCOUNT OF THE TREASURER OF THE HOME.

Remaining on hand October 1, 1896		7,925.25
Received during the year:		
From the permanent fund		107,782.80
Interest on the permanent fund		81,449.36
Effects of deceased inmates, subject to demand of legal heirs		3,027.99
Miscellaneous receipts		2,925.02
Total receipts		203,110.42
Disbursements:		
Current expenses	$163,744.88	
Permanent improvements	31,101.40	
Total disbursements		194,846.28
Balance on hand September 30, 1897		8,264.14

The foregoing statement of the permanent fund shows that the revenue of the Home from settlements made by the Treasury Department on account of forfeitures of deserters and dishonorably discharged men and court-martial fines decreased by $11,444.26 during the year. This decrease in the income is due to the full payment monthly of all pay due to the soldier, which leaves very little retained pay subject to forfeiture by deserters and dishonorably discharged men.

The current expenses of the Home, as shown by the treasurer's statement, were $8,479.51 more than last year. This increase is due to the extensive repairs that have been made in all parts of the Home. The amount expended for permanent improvements ($31,101.40) was principally for completing the amusement hall, purchase of material and hire of labor used in wiring for electric light plant, new sidewalks, repairs to Barnes Hospital, etc.

Some of the principal items of the current expenses were:

Subsistence	$31,216.97
Expenses of hospital	16,807.71
Clothing for inmates	9,001.21
Farm, garden, and ornamentation of grounds	19,636 61
Extra-duty pay and monthly allowance to nonpensioners	21,578.52
Commutation to members residing outside of Home	27,843.48

The treasurer's account of funds received for the inmate pensioners shows that he had on hand September 30, 1896, $46,844.98; that he received during the year $84,680.27, and paid to pensioners and legal heirs of deceased inmates $87,809.58, leaving on hand deposited in the United States Treasury, as required by law, $43,715.67.

The report of the governor of the Home shows that of the 724 resident inmates 566 are receiving pensions, as follows: 185 receive from $6 to $8 per month, 300 from $10 to $16, 60 from $17 to $20, 19 from $22 to $30, 1 $50, and 1 $72 per month.

There are 185 beneficiaries of the Home who served in the war with Mexico, 149 of whom are drawing outdoor relief, and 421 who served in the war of the rebellion, of whom 120 are on outdoor relief, making a total of 606 members who had war service.

The attending surgeon reports that 433 patients were treated in hospital; that the daily average was 75.91, and the average age of patients admitted was 52.27; that 2,291 were treated at sick call, and the proportion of deaths to 100 inmates per annum was 4.16. The attending surgeon also reports that 10 patients from the Army, not members of the Home, were temporarily admitted to the hospital for treatment for inguinal hernia.

The sanitary condition of the Home and grounds has been excellent throughout the year, and there has been no prevalent nor epidemic disease among the inmates.

The act of Congress approved January 19, 1891, requiring the treasurer to keep the current funds on deposit in the United States Treasury, has been complied with, and all supplies for the Home which could be conveniently purchased by contract were so purchased.

In the last annual report mention was made of the early completion of the amusement hall. After excessive delay on the part of the contractor the hall was finally completed January 28, 1897. Since then a variety of excellent entertainments have been given, which have afforded great pleasure to the inmates of the Home. In addition to the main hall, with its fine stage and large seating capacity, there is in the basement of the building a smaller hall, in which the societies of the Grand Army Post and Regular Army and Navy Union, composed almost wholly of inmates, hold their meetings. The building is of Vermont marble and brick, nearly fireproof, there being but little woodwork in the interior, and is found to be well suited in every respect for the purpose for which it was constructed.

The cost of lighting the Home with gas being deemed quite excessive, over $3,000 per annum, the subject of supplying electric light instead was duly considered by the board with the view of securing a better light and possibly a decrease in the large annual outlay for this purpose. The board, after a very full examination into this matter, decided to install an electric-light plant, the cost of which was estimated at $15,000, and received the approval of the Secretary of War. Accordingly the treasurer of the Home was instructed to purchase the necessary material and employ the labor required to do the wiring for electric lighting. Proposals were also invited for the necessary electrical machinery, and on September 20, 1897, the contract was awarded to Morton, Reed & Co., of Baltimore, at $9,154, the lowest bidders, whose bid complied with the specifications, for putting in an electric plant—engines, dynamos, etc. It is expected that the electric plant will be in full operation by January 1 next.

The governor reports that almost the only disorders that have occurred at the Home were the result of intemperance, and that as the evil can not be cured it is dealt with firmly, and in the case of old men very mildly. In this connection it is to be noted that the attending surgeon's reports show that the number admitted to the hospital for treatment for alcoholism was 36 during the year, and that last year the number was 43, a decrease of 7 with an increased number of inmates. While all practicable means may be adopted by the officers of the Home to check intemperance, it is an evil which can not be eradicated from an institution of this kind where most of the inmates are necessarily without occupation and are furnished food, clothing, quarters, and medical

attendance free of cost without taxing their pensions, which range, with two exceptions, from $6 to $30 per month. It is, therefore, a difficult problem to keep the inmates, and those constantly coming in, from over indulgence in liquor, and the most that can be hoped for under the present law governing the Home is a reduction of the evil by the application of wise disciplinary measures.

Special attention has been given by the Commissioners to the food supplies purchased under contract for the Home, and the quality of many of the articles has been brought up to a higher standard. The food supplied the inmates has been of good quality, well prepared, and left no reasonable ground for complaint.

The library of the Home contains 6,249 volumes. Nine daily and 16 weekly papers and 17 monthly magazines are provided. The daily average number of inmates who visited the library and reading room was 225, about one-third of the inmates.

Under the authority granted by the sundry civil act, approved June 4, 1897, medical and hospital supplies required for the Home are now purchased from the Medical Department of the Army.

The buildings have been kept in good repair, and the beautiful grounds and walks and the 10 miles of fine driveways are in excellent condition.

The following changes occurred during the year in the board of commissioners and the officers of the Home:

The Commissary-General of Subsistence, Brig. Gen. Thomas C. Sullivan, appointed January 26, 1897, vice Brig. Gen. M. R. Morgan, retired January 18, 1897.

The Quartermaster-General, Brig. Gen. George H. Weeks, appointed February 18, 1897, vice Brig. Gen. Charles G. Sawtelle, retired February 16, 1897.

The Adjutant-General, Brig. Gen. Samuel Breck, appointed September 11, 1897, vice Brig. Gen. George D. Ruggles, retired on that date.

Capt. David A. Irwin, deputy governor, was relieved from duty December 4, 1896, by Bvt. Brig. Gen. Reuben F. Bernard, lieutenant-colonel, U. S. A.

Capt. Richard C. Parker, U. S. A., secretary and treasurer, was relieved from duty April 1, 1897, by First Lieut. Eugene F. Ladd, Ninth Cavalry.

Regular meetings have been held by the board for the transaction of the business pertaining to the Home, and the regular monthly inspections have been made as required by law.

The accompanying papers are reports of the governor, the attending surgeon, and the treasurer of the Home; a statement of receipts and expenditures; statements of the permanent fund and of the interest account; statements of accounts of the pension money of inmate pensioners and their rates of pension; the debit and credit accounts with the farm and garden, and report of members on outdoor relief, all of which are required to be published for distribution to the Army, as directed by the section and act mentioned in the first paragraph of this report.

Very respectfully, NELSON A. MILES,
Major-General Commanding the Army,
President Board of Commissioners.

The SECRETARY OF WAR.

REPORT OF THE GOVERNOR OF THE SOLDIERS' HOME.

GOVERNOR'S OFFICE, UNITED STATES SOLDIERS' HOME,
Washington, D. C., October 14, 1897.

GENTLEMEN: I have the honor to submit the following tables, giving in figures a census of the Soldiers' Home during the past year:

Number of pensioners present at the Home and rate of pension.

Rate per month.	Number.	Rate per month.	Number.	Rate per month.	Number.
$6	87	$17	57	$72	1
8	98	18	1		
10	45	20	2	Total present	566
12	194	22	1	Total present, 1896	563
12.50	1	24	11	Total present, 1895	510
14	39	30	7		
16	21	50	1		

Applying for readmission during the year		174
Readmitted		107
Temporarily readmitted for medical treatment		59
Denied readmission		8
Applying for outdoor relief		135
Granted outdoor relief		63
Denied outdoor relief		72
Inmates present having service in Mexico	36	
Inmates on outdoor relief having service in Mexico	149	
Total inmates having service in Mexico		185
Inmates present having service in war of the rebellion	301	
Inmates on outdoor relief having service in war of the rebellion	120	
Total inmates having service in the war of the rebellion		421

Natirity of inmates present and absent.

United States	459	Scotland	16
Ireland	344	Switzerland	12
Germany	192	Austria	10
England	50	France	8
Canada	22	Denmark	6
Sweden	6	Russia	5
Belgium	3	Norway	2
Holland	2	Italy	1
Jamaica, West India Islands	1	Portugal	1
Cuba	1		

The alterations since last annual report, dated September 30, 1896, are as follows:

Schedule of admissions to the Home.

Permanent beneficiaries September 30, 1896		1,017
Admitted during the year		179
Readmitted during the year		107
Total		1,303
Dropped:		
By withdrawal	152	
For absence without leave	24	
Dismissed	16	
Abandoned the Home	2	
Dropped by order	3	
Dropped for filthiness	1	
Died	48	
From outdoor relief	19	
		265
Permanent beneficiaries September 30, 1897		1,038

Temporary inmates:		
Present September 30, 1896	81	
Admitted during the year	217	
Total temporary beneficiaries		298
Transferred to permanent rolls	60	
Dropped	122	
Dismissed	7	
Died	6	
		195
Remaining temporary inmates, including 6 in insane asylum		103
Total beneficiaries		1,141

Of whom 724 are inmates of the Home; 342 receive outdoor relief; 18 are in insane asylum; 56 on furlough; 1 absent, sick.

Increase in the number of temporary inmates for the year, 22; increase in the number of regular inmates for the year, 21. The aggregate is 43 more than was shown on last report. Of the 54 deaths reported, 2 died on furlough, 1 in insane asylum, 30 in Home hospital, 15 on outdoor relief, 2 near the Home, and 4 committed suicide. Daily average number of inmates present during the year, 724. Last year the average was 684¾, and the preceding year 678¼.

Transients.—During the year 12,647 meals have been furnished to destitute discharged soldiers and 227 have been provided with lodgings for a few nights each. The aggregate is an increase of 43 over the former year.

The reports of the surgeon in charge of the hospital, and of the treasurer, give in items all the facts illustrating the details of the hospital and administration of the finances and economy of the entire Home establishment.

The season has been favorable, and the farm, the forest, the garden and grounds have all been beautiful and productive this year. The forest shows little mark of the tornado which damaged it last year.

The rules of discipline adopted in former years have been carried out, and have maintained good order during the past year. The almost sole disorder in this Home comes from intemperance, and as it can not be cured it is dealt with firmly, but very mildly in cases of men of long service and old age. Intemperate men are not so damaging to the Home as the class of young men discharged from the Army, on disabilities which are slight, yet sufficient, frequently, to enable them to gain admission to the Home. When once fixed here with a pension, this class becomes a discredit to the Home and should be weeded out.

The new amusement hall has proved a great source of amusement and satisfaction to the members of the Home. From December 1, 1896, until May, 1897, forty-eight entertainments were given for the amusement of the members, varying from a cantata, with 60 singers, to a dancing school for little children. These amusements are paid for out of Home funds.

The band of the Home has greatly improved during the year, and is now quite equal to the average regimental band of the Army. The new system of securing musicians and the talent of the leader has effected the change.

The increase in the number of milch cows, to be used as farm stock and under the same expenditure, is recommended; the cows to be bought gradually until the number sufficient to furnish all the milk for the Home is procured. This will be economy, and will keep up the fertility of the Home grounds, now getting poorer every year.

A conservatory to exhibit the flowers now raised in great numbers in our greenhouses is recommended. Sufficient surplus heat is available at the power house, and such a building can be built and kept going very cheaply.

Home library.

Number of volumes on hand	6,249
Number of volumes added during year	194
Periodicals in reading room:	
Daily papers	9
Weekly papers	16
Monthly magazines	17
Number of volumes issued during year	14,082
Average daily issue	38
Daily average of inmates visiting the library and reading room	225

Respectfully,

D. S. STANLEY,
Brigadier-General, Brevet Major-General, Governor.

The BOARD OF COMMISSIONERS UNITED STATES SOLDIERS' HOME.

REPORT OF THE ATTENDING SURGEON OF THE SOLDIERS' HOME.

UNITED STATES SOLDIERS' HOME,
Washington, D. C., September 30, 1897.

SIR: I have the honor to submit the following report of the medical department of the Home for the past year, ending September 30, 1897:

	1897.	1896.	1895.	1894.
Patients remaining in hospital from last report	76	81	78	85
Patients admitted to hospital during the year	357	341	348	310
Total treated in hospital	433	422	426	395
Returned to the Home recovered, mostly acute cases	133	137	139	146
Returned to the Home improved, mostly chronic cases	103	94	94	84
Returned to the Home unimproved, incurable	82	66	79	43
Sent to the United States Hospital for the Insane	3	2	3	3
Died in hospital	30	42	29	35
Dead when brought to hospital	3	5	1	6
Remaining in hospital at present date	79	76	81	78
Total	433	422	426	395

Ages of patients admitted.

	1897.	1896.	1895.	1894.
Under 20 years	1	0	0	0
From 20 to 29 years	27	24	19	35
From 30 to 39 years	45	36	40	31
From 40 to 49 years	67	76	79	63
From 50 to 59 years	92	86	90	81
From 60 to 69 years	78	72	73	66
From 70 to 79 years	41	36	42	32
From 80 to 89 years	6	11	5	2
Age of the youngest.....years	19	20	23	22
Age of the oldest.....do	85	84	85	81
Average age of patients admitted.....do	52.27	53.03	52.85	51.75
Greatest number of patients at one time	83	86	86	86
Least number of patients at one time	61	67	62	64
Daily average of patients in hospital	75.91	77.18	76.34	76.45

Diseases for which patients were admitted to hospital.

Disease.	Patients.	Disease.	Patients.
Abdomen, malignant tumor of	1	Cervical adenitis	2
Abscesses	5	Cholera morbus	6
Alcoholism	36	Conjunctivitis	3
Amputation of both legs, old	1	Constipation	3
Amputation of leg for old fracture	1	Corn, inflamed	1
Aneurism of aorta	4	Cystitis	3
Aphasia	4	Delirium tremens	3
Appendicitis	1	Dementia	6
Arm, old injury	1	Diabetes:	
Arthritis deformans	1	Insipidus	1
Asthma	16	Mellitus	2
Back, old injury	1	Diarrhea	9
Bladder:		Dislocation of shoulder	1
Irritability of	6	Dorsal muscles, weakness of	1
Stone in	1	Drowning, accidental	1
Bronchitis:		Ecthyma	1
Acute	5	Eczema	3
Chronic	15	Epilepsy	13
Broncho-pneumonia	1	Epistaxis	1
Cancer:		Erysipelas	1
Face	2	Esophagus, stricture of	1
Face and hand	1	Facial paralysis	1
Lip	2	Feet, edema of	1
Liver	2	Forearm, old injury	1
Rectum	1	Fractures:	
Cerebral hemorrhage	1	Femur	1
Cerebral softening, acute	1	Humerus	1

Diseases for which patients were admitted to hospital—Continued.

Disease.	Patients.	Disease.	Patients.
Fractures—Continued.		Ophthalmia, chronic	1
Rib	1	Osteomyelitis of tibia, chronic	1
Tibia and fibula	1	Pain in right hypochondrium	1
Wrist	2	Paretic dementia	1
Gonorrhea	8	Partial loss of use of both ankles and right knee	1
Gunshot wound of thigh, old	1	Perineal abscess	1
Hand:		Pharyngitis, chronic	1
Old injury	1	Pleuritic adhesions and partial consolidation of lung	1
Paralysis and atrophy from injury of ulnar nerve	1	Pneumonia:	
Hanging, suicidal	1	Acute	1
Headache	3	Subacute	1
Heart disease	15	Chronic	3
Hemiplegia	6	Prostate, enlarged	1
Hemorrhoids	5	Pulmonary congestion	1
Hernia:		Rectum, ulcer of	1
Adductor longus muscle	1	Renal colic and calculi	2
Inguinal	1	Rheumatism:	
Ventral	2	Acute	1
Herpes zoster	1	Subacute	1
Hip:		Chronic	36
Contusion	2	Rhus toxicodendron poisoning	1
Subacute arthritis and anchylosis	1	Sebaceous cyst	1
Hydrocele	2	Senile debility	12
Hysteria	1	Senile dementia	3
Incontinence of feces	1	Shoulder, contusion of	2
Indigestion	9	Spine, old injury	1
Influenza	7	Sprain of ankle	5
Insanity	6	Synechia, anterior, and perforation of cornea	1
Jacksonian epilepsy and typhoid fever	1	Synovitis of knee joint, chronic	2
Kidneys, suppuration in	2	Syphilis, secondary	1
Knee, anchylosis of	2	Tetanus	1
Leukemia, splenic-myelogenous	2	Tuberculosis:	
Liver, cirrhosis of	1	General	4
Locomotor ataxia	7	Genito-urinary	1
Lumbago	2	Intestinal	1
Malarial cachexia, chronic	1	Pulmonary	23
Malarial fever	11	Typhoid fever	1
Melancholia	2	Ulcers	5
Meniere's disease	1	Urethra, stricture of	2
Mental depression	1	Urine, retention of	3
Morphinism	2	Urine, suppression of	3
Multiple sclerosis	1	Varicose veins	1
Myelitis, chronic	1	Vertigo	2
Nasal catarrh	1	Webbed finger stumps	1
Nephritis, chronic	1	Wounds	7
Neuralgia	2		
Neurasthenia	1		

This list exhibits only the diseases complained of by the patients at the time of admission to the hospital, and does not include the numerous complications, operations, nor secondary affections arising during the course of treatment. The principal troubles are tuberculosis, chronic rheumatism, heart disease, hernia, catarrh, epilepsy, dyspepsia, and constipation. Many of the men are affected with two or more of these diseases at the same time, and yet may be admitted to hospital for some minor complaint not connected with either.

The 2,291 cases treated at sick call are not included in the above list of diseases.

The following patients, not members of the Home, were temporarily admitted to hospital for treatment during the year:

Name.	Service.	Disease.
McRae, Malcolm D	Civil-service employee	Inguinal hernia.
Dye, Robert R	Private, Company L, Fourth Artillery	Do.
Doyle, Nicholas	Private, Company F, Ninth Infantry	Do.
Snider, Charles P	Private, Company C, Twenty-first Infantry	Do.
Kelly, Michael	First sergeant, Company C, Twenty-first Infantry	Do.
Hobson, Charles W	Private, Company C, Twenty-first Infantry	Do.
Heitler, L. B	Private, band, Fifth Artillery	Do.
D'Aiutolo, Agostino	Principal musician, Second Artillery	Appendicitis.
Henry, Hugh H	Private, Company I, First Artillery	Inguinal hernia.
Taylor, Samuel M	Private, Company H, Sixth Infantry	Do.

Necrology.

Name.	Age.	Nativity.	Last served in company and regiment.	Died.	Cause of death.
				1898.	
Stewart, Frank A	29	Ireland	B, 3d Inf	Oct. 22	Consumption.
Klipfel, John	81	Germany	C, 3d Inf	Oct. 25	Old age.
Hogan, Thomas	52	Ireland	I, 14th Inf	Nov. 23	Consumption.
Leopold, Sebastian	84	France	E, 4th Art	Dec. 14	Heart disease.
Thompson, Charles C	33	United States	L, 4th Art	Dec. 24	Consumption.
				1897.	
Hayden, Michael	61	Ireland	F, 4th Inf	Jan. 2	Aneurism of aorta.
Havlin, John	61	United States	F, 4th Inf	Feb. 6	Consumption.
Rosenswick, Leopold	36	Germany	E, 18th Inf	Feb. 8	Heart disease.
Williams, James	60	England	B, 12th Inf	Feb. 14	Do.
Campbell, John	74	Ireland	A, 14th Inf	Feb. 21	Consumption.
Wilson, William T	44	United States	A, 5th Art	Feb. 23	Heart disease.
Becker, Anton	73	Germany	M, 2d Art	Feb. 26	Pneumonia.
Reich, Charles	68	do	A, 12th Inf	Mar. 2	Cancer of liver.
Brown, James	77	Ireland	Gen. service	Mar. 2	Senile paretic dementia.
Berns, William	78	Germany	E, 1st Inf	Mar. 3	Old age.
Miller, Charles	67	do	I, 21st Inf	Mar. 8	Do.
Condon, John *a*	69	Ireland	B, 8th Cav	Mar. 14	Suicide.
Reed, Henry	53	United States	A, 4th Cav	Apr. 5	Do.
Swick, Hugh M	61	do	Signal Corps	Apr. 15	Softening of brain.
Driscoll, William	42	Ireland	G, 11th Inf	Apr. 27	Heart disease.
Butler, James	67	do	I, 4th Inf	May 27	Cerebral hemorrhage.
Mickler, Frank	27	Germany	F, 18th Inf	June 3	Consumption.
Louthood, Ralph	56	Scotland	H, 5th Art	June 23	Do.
Sheridan, Terence	65	Ireland	B, 8th Cav	June 25	Subdural hemorrhage.
Burke, John	70	do	E, 1st Inf	June 29	Old age.
Minott, Joseph	52	United States	F, 9th Cav	July 1	Lockjaw.
Weiss, Conrad	72	Switzerland	H, 3d Inf	July 4	Consumption.
Bourasso, Francis L. *a*	68	United States	E, 15th Inf	July 15	Accidental drowning.
Bidwell, Wallace	27	do	F, 11th Inf	Aug. 10	Heart disease.
Chambers, Charles	75	Ireland	Ordnance	Aug. 13	Do.
Siegel, Bernhard	68	Germany	E, 8th Inf	Aug. 15	Softening of brain.
Hickey, Martin	28	United States	F, 3d Cav	Sept. 8	Consumption.
Mair, Charles *a*	54	Germany	E, 4th Inf	Sept. 19	Suicide.

a Dead when brought to hospital.

The daily average of inmates present at the Home was: For 1893, 751; for 1894, 734; for 1895, 676; for 1896, 688; for 1897, 722.

Proportion of deaths to 100 inmates per annum.

Year.	Per cent.	Year.	Per cent.	Year.	Per cent.
1897	4.16	1895	4.29	1893	4.66
1896	6.10	1894	4.77	1892	5.10

Number of prescriptions compounded during the year	6,664
Applications for treatment at sick call	2,291
Number of out-patients connected with the Home treated	307

Annual statement of expenses, from treasurer's records.

	1897.	1896.	1895.	1894.
Average number of men, including attendants	108	109	108	108
Subsistence	$7,791.83	$7,893.04	$7,837.93	$8,387.95
Subsistence, inmates Government Insane Asylum	2,987.85	3,539.29	3,379.28	3,740.62
Cost of medicines	1,348.91	1,388.75	1,166.41	940.27
Attendants	6,506.36	6,417.76	6,435.29	6,369.36
Ice	428.78	437.33	441.11	524.41
Fuel	112.86	1,073.91	733.97	1,646.28
Gas	761.00	1,062.40	959.00	1,012.00
Laundry	126.95	91.00	218.24	283.52
Stationery	68.51	53.90	48.60	94.89
Spectacles	22.90	31.50	39.75	82.00
Trusses		11.00	9.00	7.00
Coffins	309.70	339.86	259.02	378.51
Bedding	138.28	210.21	151.13	622.50
Repairs	2,776.16	629.66	520.80	571.92
Forage for ambulance horses	208.44	206.98	204.67	273.05
Instruments and appliances	174.54	158.67	152.55	63.73
Books	109.68	96.13	103.55	139.94
Furniture		238.02	61.00	103.60
Miscellaneous	313.20	39.74	75.98	36.75
Total	24,185.95	23,919.15	22,797.28	25,278.30
Cost per man per day ....cents..	61.35	59.96	57.83	66.10

Monthly statement of expenses of hospital from October 1, 1896, to September 30, 1897, furnished by the treasurer.

Articles, etc.	Amount.
October, 1896.	
Subsistence	$695.22
Ice	33.67
Gas	72.40
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Forage and hay	17.37
Horseshoeing	3.00
Extra washing	16.68
Repairs to elevator	32.65
Improvements, typewriter	21.00
Cotton, tape, thread	10.89
Window shades, hose	2.80
Kitchen utensils	20.45
Putty, fire clay, cement	6.75
Repairs to range	8.00
Articles for police purposes	5.23
Repairs to roof, chimneys and glass	392.28
Freight	2.20
Medical and hospital supplies	465.60
Trimmings for coffins	31.70
Medical books	14.30
Spectacles	4.75
Pay roll, extra duty	414.00
Total	2,390.94
November, 1896.	
Subsistence	713.57
Ice	29.37
Gas	89.40
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Forage and hay	17.37
Horseshoeing	3.00
Extra washing	7.66
Coal	112.86
Mortar, grates, lock	20.40
Freight	1.65
Plasterer, repairs	10.50
Painting outside hospital	789.00
Articles for police purposes	6.25
Instruments	5.70
Medical books	10.10
November, 1896—Continued.	
Medical and hospital supplies	$20.49
Lumber for coffins	41.64
Stationery and printing	7.52
Pay roll, extra duty	409.00
Total	2,415.48
December, 1896.	
Subsistence	688.42
Ice	22.02
Gas	106.60
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Forage and hay	17.37
Horseshoeing	3.00
Extra washing	10.63
Two cows	65.00
Faucets	3.00
Articles for police purposes	9.53
Repairs to ranges	21.00
Repairs, chairs and elevator	2.97
Instruments	147.50
Medical books	25.15
Spectacles	6.00
Pay roll, extra duty	425.50
Government Asylum for Insane	1,017.14
Total	2,690.83
January, 1897.	
Subsistence	673.77
Ice	16.37
Gas	122.20
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Forage and hay	17.37
Horseshoeing	3.00
Extra washing	7.98
Enamel, cord and tips	.97
Renewal jar cells	1.20
Hinges, bolts for beds	1.30
Tacks	.30
Articles for police purposes	34.64

Monthly statement of expenses of hospital from October 1, 1896, to September 30, 1897, furnished by the treasurer—Continued.

Articles, etc.	Amount.
January, 1897—Continued.	
Repairs to ranges	$3.05
Medical books	21.40
Instruments	8.63
Medical and hospital supplies	139.70
Pay roll, extra duty	425.60
Total	1,597.48
February, 1897.	
Subsistence	675.02
Ice	22.29
Gas	82.40
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Forage and hay	17.37
Horseshoeing	3.00
Extra washing	9.85
Hot water coil	5.72
Repairs to window shades	12.00
Repairs to elevator	38.90
Articles for police purposes	11.30
Medical books	3.20
Trimmings for coffins	27.20
Stationery and printing	13.90
Pay roll, extra duty	419.80
Total	1,461.95
March, 1897.	
Subsistence	696.17
Ice	27.30
Gas	77.90
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Forage and hay	17.37
Horseshoeing	3.00
Extra washing	9.38
Repairs to car track	14.88
Lumber for trays	1.71
Material for plumbing	6.25
Sheets and towels	102.28
Articles for police purposes	15.52
Instruments	4.31
Medical and hospital supplies	600.15
Coffin material	64.80
Spectacles	3.15
Pay roll, extra duty	430.40
Total	2,194.57
April, 1897.	
Subsistence	726.51
Ice	37.01
Gas	57.10
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Forage and hay	17.37
Horseshoeing	3.00
Extra washing	10.17
Repairs to ranges	23.30
Repairs to elevator	40.00
Articles for police purposes	39.52
Repairs to plumbing	12.12
Stationery and printing	8.75
False teeth	7.00
Pay roll, extra duty	396.97
Total	1,498.82
May, 1897.	
Subsistence	713.08
Ice	34.92
Gas	39.50
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Forage and hay	17.37
Horseshoeing	3.00

Articles, etc.	Amount.
May, 1897—Continued.	
Extra washing	$8.30
Range for steward's quarters	45.00
Repairs to ranges and elevator	7.86
Spice mill, wire-screen cloth	5.67
Repairs, plumbing and kitchen	5.01
Eclipse spring, 6 brass hooks	4.30
Making 2 wood screens	20.00
Purchase of 5 cows	200.00
Papering at steward's quarters	14.00
Painting third floor, hospital	100.00
Articles for police purposes	12.54
Freight	1.35
Medical and hospital supplies	4.73
Medical books	15.50
Stationery	16.25
Pay roll, extra duty	418.40
Total	1,806.78
June, 1897.	
Subsistence	790.40
Ice	49.08
Gas	31.70
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Forage and hay	17.37
Horseshoeing	3.00
Extra washing	7.63
Clothes baskets and saw	5.15
Clock, repairs to clock	7.50
Lumber for steward's quarters	4.50
Lumber for tank platform	26.78
Repairs to elevator	8.00
Repairs, invalid chairs	5.46
Plumbing material and repairs	17.10
Articles for police purposes	9.85
Painting fourth story, hospital	149.00
Medical and hospital supplies	63.31
Materials for coffins	42.98
Medical books	16.20
Instruments	8.40
Spectacles	9.00
Pay roll, extra duty	423.79
Government Asylum for Insane	985.00
Total	2,801.20
July, 1897.	
Subsistence	762.00
Ice	62.62
Gas	25.40
Pay, clinical assistant	100.00
Pay, ambulance driver	20.00
Forage and hay	17.37
Horseshoeing	3.00
Extra washing	15.20
Kerosene oil, 1 barrel	4.42
Bedspreads, 36	36.00
Wash boiler	1.50
Plumbing repairs	1.82
Asphalt, paving fan house	204.00
Articles for police purposes	29.81
Material for coffins	29.50
Medical and hospital supplies	33.77
Stationery and printing	22.09
Pay roll, extra duty	432.20
Total	1,800.70
August and September, 1897.	
Subsistence	657.67
Ice	94.13
Gas	56.40
Pay, clinical assistant	200.00
Pay, ambulance driver	40.00
Forage and hay	34.74
Horseshoeing	6.00

Monthly statement of expenses of hospital from October 1, 1896, to September 30, 1897, furnished by the treasurer—Continued.

Articles, etc.	Amount.	Articles, etc.	Amount.
August and September, 1897—Cont'd.		*August and September, 1897*—Cont'd.	
Extra washing	$23.47	Lumber, 100 barrels cement, 1 barrel Portland cement	$97.40
Material for upholstering chairs	26.91	Articles for police purposes	10.27
Repairs to elevator	20.93	Medical and hospital supplies	21.16
Ice-chest hooks	1.20	Lumber and trimmings for coffins	71.88
5,100 bricks for sidewalks	45.90	Medical books	3.83
Plumbing material	25.82	Government Asylum for Insane	985.71
Galvanized iron and bricks, for repairs	11.83	Pay roll, extra duty	870.70
Labor, grading roads at hospital	46.25		
Wrought-iron tank	175.00	Total	3,527.20

The general sanitary condition of the Home and grounds has been excellent throughout the year. The water supply and drainage are satisfactory. There has been no prevalent or epidemic disease among the inmates.

Very respectfully, your obedient servant,

W. H. FORWOOD,
Surgeon, United States Army, in charge.

The GOVERNOR OF THE HOME.

REPORT OF THE SECRETARY AND TREASURER OF THE SOLDIERS' HOME.

TREASURER'S OFFICE, UNITED STATES SOLDIERS' HOME,
Washington, D. C., October 12, 1897.

GENERAL: I have the honor to transmit herewith the annual reports of the treasurer of the Home for the year ending September 30, 1897, as follows:

Statement of receipts and expenditures of the Home fund, with recapitulation and comparative statement for the previous year.

Statements of the permanent fund and interest account, as shown by the Warrant Division, Treasury Department.

Statement of treasurer's account with the inmate pensioners.

Statement of pensioners in the Home, rates of pensions, etc.

Statement of members of the Home receiving outdoor relief, rates of relief, pensions, etc.

Statements of receipts and expenditures on account of the farm, garden, and dairy.

I have the honor to recommend the reestablishing of the dairy and its consolidation with the farm under the management of one foreman. I am satisfied, after careful observation, that the two can then be conducted at a profit and the grounds improved, whereas under the present arrangement the land will soon become exhausted. The quality and condition of the milk would undoubtedly be much improved by this arrangement.

I would recommend the purchase of a few ordinary grade cows each month until the required number have been secured.

Very respectfully,

E. F. LADD,
First Lieutenant, Ninth Cavalry, Secretary and Treasurer.

Gen. D. S. STANLEY, U. S. A.,
Governor of the Home.

Annual report of receipts and expenditures of the United States Soldiers' Home, District of Columbia, from October 1, 1896, to September 30, 1897, by First Lieut. E. F. Ladd, Ninth United States Cavalry, secretary and treasurer.

Receipts and expenditures.	1896.			1897.									Total.
	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	
RECEIPTS.													
From the United States Treasurer, upon resolutions of the Board of Commissioners approved by the Secretary of War	.....	$8,000.00	$20,000.00	.....	$11,782.80	$18,000.00	.....	.....	$22,000.00	.....	$8,000.00	$20,000.00	$107,782.80
From interest on permanent fund	$20,245.64	.....	.....	$20,315.21	.....	.....	$20,404.02	.....	.....	$20,484.49	.....	.....	81,449.36
From effects of deceased inmates, subject to demand of legal heirs	29.13	.05	17.12	10.25	298.86	311.73	225.55	.....	.56	.25	2,023.20	111.29	3,027.99
From miscellaneous sources	37.87	56.16	411.15	161.34	37.49	35.25	10.63	$78.59	421.35	28.83	80.32	1,566.04	2,925.02
Total	20,312.64	8,056.21	20,428.27	20,486.80	12,119.15	18,346.98	20,640.20	78.59	22,421.91	20,513.57	10,103.52	21,677.33	195,185.17
EXPENDITURES.													
Repairs to officers' quarters	15.56	34.82	5.20	.....	11.84	2.25	58.00	6.90	223.42	22.17	18.00	33.29	431.45
Compensation of the governor, deputy governor, treasurer, and clerk to Board of Commissioners	348.74	348.74	373.18	373.74	373.74	75.83	595.82	297.91	372.91	372.91	372.91	372.91	4,279.34
Transportation furnished to discharged soldiers en route to the Home, to be refunded to the Quartermaster's Department	97.07	.....	55.10	23.85	58.60	45.13	.....	145.03	28.96	63.05	.....	.....	516.79
Fuel for the Home	.....	2,783.54	1,142.50	.....	2,628.58	99.16	1,142.89	839.48	1,046.16	.....	10.63	109.50	9,802.44
Expenses of the hospital for medicines, medical stores, spectacles, false teeth, materials for coffins, etc.	518.60	77.93	180.90	.....	169.73	30.40	672.41	7.00	18.58	139.89	63.27	96.87	1,975.58
Expenses of the hospital for mess and kitchen purposes and all running expenses, including compensation to inmates on duty and pay of civilian employees	1,297.34	1,359.80	1,225.34	535.75	1,176.05	786.84	1,452.06	1,327.95	1,455.63	1,384.45	1,198.23	1,632.69	14,832.13
Refunded to claimants as heirs of deceased soldiers	.....	.....	125.17	182.82	106.75	11.24	374.36	295.79	.....	.....	256.82	.....	1,352.94
Refunded to claimants as heirs of deceased inmates	4.42	142.00	445.00	17.00	10.25	4.50	668.28	1.42	10.23	.....	.....	1.25	1,304.35
Clothing for inmates of the Home	5,922.28	33.08	12.00	.....	.....	10.30	3,023.55	.....	.....	.....	.....	.....	9,001.21
Repairs to Home bakery	.....	3.12	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3.12

Annual report of receipts and expenditures of the United States Soldiers' Home, District of Columbia—Continued.

Receipts and expenditures.	1896.			1897.									Total.
	October.	November.	December.	January.	February.	March.	April.	May.	June.	July.	August.	September.	
EXPENDITURES—continued.													
Farm, garden, and dairy utensils, seeds, guano, manure, cultivation of garden, ornamentation of grounds, pay of farm, garden, dairy, and other employees	$1,380.84	$1,305.46	$1,320.40	$1,523.21	$1,224.12	$95.91	$1,522.86	$1,828.47	$2,432.46	$1,608.88	$1,676.95	$3,657.05	$19,636.61
Subsistence stores and ice, including special diet for the sick	2,586.66	2,836.54	3,050.28	.....	2,709.05	2,683.24	3,145.89	2,809.33	2,989.30	3,009.74	2,947.08	2,549.86	31,316.97
Bedding for inmates, bedsteads, blankets, upholsterers' materials, etc	88.05	.....	.....	.45	22.13	.....	152.55	.....	16.00	18.72	19.47	21.97	339.34
Mess and kitchen utensils and all other articles, except bedding, for the Home	84.35	15.85	133.34	.....	72.30	55.97	90.02	110.08	153.48	102.79	116.67	367.02	1,301.87
Material for general repairs to buildings, repairs of roads and fences, purchase and repairs to harness, vehicles, purchase of mechanical tools	111.75	112.94	84.94	.....	109.99	117.74	82.41	1,252.67	783.96	326.62	377.21	560.90	3,921.13
Forage and medicines for Home animals, articles used in Home stables	79.71	66.03	60.31	.....	46.90	44.78	64.30	61.36	73.89	76.08	95.93	96.85	766.14
Expenses of the library, governor's and treasurer's offices, post-office box rent, stationery, etc., for Commissioners' office, freight, telegrams, and amusements	235.29	46.25	198.74	8.11	399.22	66.60	137.98	255.21	20.10	62.09	61.47	292.45	1,783.51
Incidental expenses, rental of telephone, hack hire, traveling expenses, professional services, and expenses of the Home chapel	50.55	5.56	65.78	13.00	.....	79.82	70.00	40.73	69.65	.....	6.00	113.07	514.16
Religious services	165.00	165.00	165.00	165.00	165.00	.....	330.00	165.00	165.00	165.00	165.00	165.00	1,980.00
Laundry work for the Home	136.08	136.25	135.07	160.01	.....	137.27	138.27	157.44	161.33	150.94	257.31	128.61	1,698.58
Compensation and monthly allowances to inmates, nonpensioners, on duty at the Home, except compensation to inmates on duty at Barnes Hospital	1,662.23	1,673.85	1,694.68	1,759.96	1,724.48	24.93	1,750.23	1,866.71	1,880.91	1,952.66	1,883.37	3,704.51	21,578.52
Commutation to inmates of the Home residing outside	306.67	307.74	6,046.67	264.00	272.00	290.00	6,408.00	288.00	6,486.40	373.00	304.00	6,497.00	27,843.48
Gas for the Home, including rental of gas regulators	224.80	254.10	301.80	20.00	352.90	260.30	243.40	164.70	146.00	167.30	106.60	102.90	2,353.80
Funeral expenses of members of the Home residing outside	50.00	25.00	75.00	.....	25.00	.....	50.00	50.00	25.00	.....	25.00	25.00	350.00

New buildings: New amusement hall, heating and ventilating same, increasing boiler plant, granolithic and brick pavement around amusement hall	532.00	358.37	1,170.10	20.00	17,215.69	266.33	.....	176.55	.....	20.71	20.90	453.44	20,234.09
Permanent improvements: New fences, repairs to bridges, lamp-posts, gas lamps, paving, sewerage, etc., repainting outside of Barnes Hospital and third floor of hospital inside, repairs to steam pump boiler house, increasing water supply at farm stables, boiler, and green house	532.70	916.17	32.49	.....	.....	119.70	54.00	104.42	517.34	164.34	459.48	1,020.46	3,921.10
Purchase of animals: Cows and horses	.....	.....	65.00	.....	.....	230.00	.....	370.00	200.00	.....	.....	20.00	885.00
Board and medical treatment of members of the Home in the Government Hospital for the Insane	.....	.....	1,017.14	.....	.....	.....	988.57	.....	.....	985.00	.....	985.71	3,976.42
Construction of an electric plant, material and labor	.....	.....	.....	.....	.....	.....	.....	.....	.....	557.27	1,741.89	4,647.05	6,946.21
Total	16,430.69	13,008.14	19,181.13	5,136.90	28,874.32	5,547.23	23,215.85	12,622.15	19,266.71	11,723.61	12,184.19	27,655.36	194,846.28

RECAPITULATION.

RECEIPTS.

Balance on hand September 30, 1896	$7,925.25
From the United States Treasurer upon resolutions of the Board of Commissioners, approved by the Secretary of War	107,782.80
From interest on the permanent fund	81,449.36
From effects of deceased inmates subject to the demand of legal heirs	3,027.99
From miscellaneous sources	2,925.02
Total	203,110.42

EXPENDITURES.

Repairs to officers' quarters	$431.45
Compensation of the governor, deputy governor, treasurer, and clerk to the Board of Commissioners	4,279.34
Transportation furnished to discharged soldiers en route to the Home to be refunded to Quartermaster's Department	516.79
Fuel for the Home	9,802.44
Expenses of the hospital for medicines, medical stores, spectacles, false teeth, materials for coffins, etc	1,975.58
Expenses of the hospital for mess and kitchen purposes and all running expenses, including compensation to inmates on duty and pay of civilian employees	14,832.13
Refunded to claimants as heirs of deceased soldiers	1,352.94
Refunded to claimants as heirs of deceased inmates	1,304.35
Clothing for inmates	9,001.21
Repairs to Home bakery	3.12
Farm, garden, and dairy utensils, seeds, guano, manure, cultivation of garden, ornamentation of grounds, pay of farm, garden, dairy, and other employees	19,636.61
Subsistence stores and ice, including special diet for the sick	31,316.97
Bedding for inmates, bedsteads, blankets, upholsterers' materials	339.34
Mess and kitchen utensils and all other articles except bedding for the Home	1,301.87
Material for general repairs to buildings, repair of roads and fences, purchase of and repairs to harness, vehicles, and purchase of mechanical tools	3,921.13
Forage and medicines for Home animals, articles used in stables	766.14
Expenses of the library, governor's offices, treasurer's office, post-office boxrent, stationery, etc., for Commissioners' office, freight, telegrams, and amusements	1,783.51
Incidental expenses, rental of telephone, hack hire, traveling expenses, professional services, and expenses of the Home chapel	514.16
Religious services	1,980.00
Laundry work for the Home	1,698.58
Compensation and monthly allowances to inmates, nonpensioners, on duty at the Home, except inmates on duty at Barnes Hospital	21,578.52
Commutation to inmates of the Home residing outside	27,843.48
Gas for the Home, including rental of gas regulators	2,353.80
Funeral expenses of members of the Home residing outside	350.00
New buildings: New amusement hall, heating and ventilating same, and increasing the boiler plant, labor and material constructing electric plant	27,180.30
Permanent improvements: New fences, repairs to bridges, lamp-posts, gas lamps, paving, sewerage, etc., repainting outside of Barnes Hospital, and third floor of hospital inside, repairs to steam-pump boiler house, increasing water supply at farm, stables, boiler, and greenhouses	3,921.10
Purchase of animals, cows and horses	885.00
Board and medical treatment of members of the Home in Government Hospital for the Insane	3,976.42
Balance on hand September 30, 1897	8,264.14
Total	203,110.42

Comparative statement of money received and disbursed on account of the United States Soldiers' Home for two years—October 1, 1895, to September 30, 1897.

Received from October 1, 1895, to September 30, 1896	$217,627.80
Expended from October 1, 1895, to September 30, 1896	209,702.64
Balance on hand September 30, 1896	7,925.25
Received from October 1, 1896, to September 30, 1897	203,110.42
Expended from October 1, 1896, to September 30, 1897	194,846.28
Balance on hand September 30, 1897	8,264.14
The expenditures during the year ending September 30, 1896, for new buildings and permanent improvements were	54,437.27
The running expenses for the year were	155,265.37
The expenditures during the year ending September 30, 1897, for new buildings and permanent improvements were	31,101.40
The running expenses for the year were	163,744.88
Average cost per man per year	$177.30
Average cost per man per month	$14.77
Average number of inmates for the year ending September 30, 1897	724
Average cost of ration per man per month, including vegetables and fruit, raised on Home grounds	$4.79
Average cost of ration per day	$0.15⅞

I certify that the foregoing statement is correct.

E. T. LADD,
First Lieutenant, Ninth United States Cavalry, Secretary and Treasurer.

Statement of the Soldiers' Home permanent fund account from October 1, 1896, to September 30, 1897.

Date.		Partial amounts.	Dr.	Cr.
1896.				
Oct. 1	Balance			$2,711,124.52
Oct. 29	Amount of deposits	$8,128.60		
Dec. 28	.....do	40,537.99		
1897.				
Mar. 26	.....do	3,284.11		
Apr. 10	.....do	28,164.38		
Apr. 28	.....do	8,509.29		
July 26	.....do	28,624.64		
Sept. 28	.....do	17,007.22		
				134,256.23
1896.				
Nov. 9	Less amount paid from permanent fund	8,000.00		
Dec. 8	.....do	20,000.00		
1897.				
Feb. 8	.....do	5,000.00		
Feb. 13	.....do	6,782.80		
Mar. 6	.....do	18,000.00		
June 9	.....do	22,000.00		
Aug. 24	.....do	8,000.00		
Sept. 11	.....do	20,000.00		
			$107,782.80	
	Balance		2,737,597.95	
	Total		2,845,380.75	2,845,380.75

Statement of the Soldiers' Home interest account from October 1, 1896, to September 30, 1897.

	Partial amounts.	Dr.	Cr.
Balance, Oct. 1, 1896			$20,245.64
Interest on balance, $2,711,124.52, from Oct. 1 to Dec. 31, 1896	$20,333.43		
Interest on deposit, Oct. 29 to Dec. 31, 1896	42.75		
Interest on deposit, Dec. 28 to Dec. 31, 1896	13.33		
			20,389.51
Interest on balance, $2,731,791.11, from Jan. 1 to Mar. 31, 1897	20,488.43		
Interest on deposit, Mar. 26 to Mar. 31, 1897	1.62		
			20,490.05
Interest on balance, $2,705,292.42, from April 1 to June 30, 1897	20,289.69		
Interest on deposit, Apr. 10 to June 30, 1897	189.82		
Interest on deposit, Apr. 28 to June 30, 1897	44.76		
			20,524.27
Interest on balance, $2,719,966.09, from July 1 to Sept. 30, 1897	20,399.75		
Interest on deposit, July 26 to Sept. 30, 1897	157.60		
Interest on deposit, Sept. 28 to Sept. 30, 1897	4.19		
			20,561.54
Less interest on principal paid—			
Fourth quarter of 1896	74.30		
First quarter of 1897	86.03		
Second quarter of 1897	39.78		
Third quarter of 1897	57.86		
		$257.97	
Less interest paid—			
Fourth quarter of 1896	20,245.64		
First quarter of 1897	20,315.21		
Second quarter of 1897	20,404.02		
Third quarter of 1897	20,484.49		
		81,449.36	
Balance		20,503.68	
Total		102,211.01	102,211.01

The treasurer of the United States Soldiers' Home, Washington, D. C., in account with the inmate pensioners for moneys received under section 4, act approved March 3, 1883, and deposited with the Treasurer of the United States, Washington, D. C.

DR.

Date.	Moneys received.	Amount.
1896.		
Oct. 1	To balance on hand	$46,844.98
Oct. 31	To S. L. Willson's checks	769.07
Nov. 30	.....do	40.46
Dec. 31	.....do	21,244.29
1897.		
Jan. 31	.....do	386.50
Feb. 28	.....do	322.60
Mar. 31	.....do	20,695.69
Apr. 30	.....do	441.66
May 31	.....do	366.77
June 30	.....do	19,401.44
July 31	.....do	1,012.78
Aug. 31	.....do	155.40
Sept. 30	.....do	19,843.66
	Total	131,525.25

CR.

Date.	Moneys disbursed.	Amount.
1896.		
Oct. 31	By pension pay roll for October, 1896	$1,348.87
Nov. 30	By pension pay roll for November, 1896	575.26
28	By amount paid the estate of Wm. R. Heine, deceased	12.00
Dec. 31	By amount paid John W. Boone, pensioner	28.00
31	By pension pay roll for December, 1896	16,951.74
1897.		
Jan. 13	By amount paid the estate of John A. Cain, deceased	50.00
15	By amount paid Michael Hoan, pensioner	50.00
18	By amount paid the estate of Seb. Leopold, deceased	2.00
31	By pension pay roll for January, 1897	1,064.20
Feb. 8	By amount paid Michael McDonough, pensioner	30.00
12	By amount paid the estate of Mich'l Hayden, deceased	6.00
25	By amount paid Patrick Burke, pensioner	100.00
28	By pension pay roll for February, 1897	1,011.20
Mar. 6	By amount paid the estate of Leop. Rosenswick, deceased	16.50
8	By amount paid Patrick Burke, pensioner	475.00
31	By pension pay roll for March, 1897	15,750.16
Apr. 5	By amount paid the estate of Charles Miller, deceased	269.00
5	By amount paid the estate of William Berns, deceased	251.00
5	By amount paid the estate of John Campbell, deceased	132.00
30	By amount paid the estate of James Brown, deceased	36.00
30	By pension pay roll for April, 1897	4,265.98
May 5	By amount paid the estate of William Rish, deceased	78.00
20	By amount paid the estate of J. F. Petschow, deceased	81.00
20	By amount paid the estate of William Driscoll, deceased	81.00
31	By pension pay roll for May, 1897	577.77
June 4	By amount paid the estate of John Condon, deceased	12.00
30	By pension pay roll for June, 1897	19,639.68
July 31	By pension pay roll for July, 1897	8,674.78
Aug. 31	By pension pay roll for August, 1897	2,416.40
Sept. 30	By pension pay roll for September, 1897	17,575.76
30	By pension moneys of deceased pensioners transferred to the Home fund	1,248.33
	By balance in United States Treasury	43,715.67
	Total	131,525.25

I certify on honor that the above account is correct.

E. F. LADD,
First Lieutenant, Ninth Cavalry, Secretary and Treasurer.

Annual report of the number of pensioners in the United States Soldiers' Home, District of Columbia, rates of pensions, etc., September 30, 1897.

Pensioners drawing per month—	
$6	157
$8	141
$10	52
$12	304
$12.50	1
$14	45
$15	2
$16	25
$17	72
$18	1
Pensioners drawing per month—	
$20	3
$22	2
$24	20
$25	1
$30	8
$50	1
$72	1
Total	836

Pensioners present in the Home:		
Pensioners whose money is drawn by the treasurer	566	
Pensioners who have assigned their certificates	10	
		576
Pensioners absent:		
On outdoor relief	256	
On suspension	4	
		260
Total number of pensioners Sept. 30, 1897		836
Total number of pensioners Sept. 30, 1896		830
Alterations since last report, Sept. 30, 1896:		
New certificates received for inmates	65	
Admitted and readmitted	191	
		256
Loss by discharge	207	
Loss by death	43	
		250
Net gain during the year		6
Description of certificates:		
Army invalids		522
Army, act of June 27, 1890		139
Mexican war		172
Indian war		1
Navy, original		2
		836

NOTE.—There are 5 pensioners in the Government Hospital for the Insane whose money is drawn by the treasurer.

Annual report of members of the United States Soldiers' Home receiving outdoor relief September 30, 1897, rates of relief, pensions, etc.

Number receiving outdoor relief:	
$8 per month	284
$4 per month	2
$2 per month	56
Total	342
Number receiving outdoor relief Sept. 30, 1896	326
Net gain during the year	16
Nonpensioners receiving outdoor relief	86
Receiving pensions:	
$6 per month	63
$8 per month	39
$10 per month	5
$12 per month	117
$14 per month	5
$16 per month	4
Receiving pensions—Continued.	
$17 per month	11
$20 per month	1
$22 per month	1
$24 per month	6
$25 per month	1
$30 per month	3
Total nonpensioners	86
Total pensioners	256
Grand total	342
Of this number there are—	
Mexican war survivors	146
Men who have served 25 years or over	52
Of this latter number there are nonpensioners	9

Fifteen members of the Home on outdoor relief have died since date of last report.

Ten members of the Home were dropped from outdoor relief after June 30, 1897, in compliance with resolutions of the Board of Commissioners dated June 19, 1891, July 17 and August 21, 1897.

Farm account United States Soldiers' Home from October 1, 1896, to September 30, 1897, consolidated.

Dr.	
Labor, forage, fuel, fertilizers, implements, and repairs	$4,860.43
Balance to credit of farm	635.89
Total	5,496.32

Cr.	
111 bushels beets	62.00
14,236 heads cabbage	300.86
28 barrels cabbage	16.56
67½ bushels carrots	33.05
1,486½ dozen ears corn	148.65
86½ bushels cucumbers	31.40
960 pounds horseradish	28.80
140½ bushels kale	33.72
5 224 heads lettuce	$156.72
6,924 bunches onions	69.37
5,595 bunches parsley	141.68
1,195¾ bushels potatoes	774.85
20½ bushels radishes	18.48
3,940 bunches rhubarb	93.35
74 bushels salsify	47.37
303 bushels spinach	68.40
2,874 pounds squash	21.56
96½ bushels string beans	54.35
679½ bushels tomatoes	311.97
415¾ bushels turnips	83.18
300 tons hay	3,000.00
Total	5,496.32

Estimate of vegetables in the ground on United States Soldiers' Home farm September 30, 1897.

100 bushels beets, at 40 cents	$40.00
10,000 heads cabbage, at 2 cents	200.00
100 bushels carrots, at 50 cents	50.00
6,000 bunches parsley, at 2 cents	120.00
250 bushels parsnips, at 50 cents	125.00
1,000 pounds horseradish, at 3 cents	30.00
75 bushels spinach, at 20 cents	$15.00
50 bushels turnips, at 20 cents	10.00
150 bushels salsify, at 50 cents	75.00
Total	665.00

Garden account of United States Soldiers' Home from October 1, 1896, to September 30, 1897, consolidated.

Dr.	
Labor, fertilizers, seeds, tools, fuel, and implements	$5,354.32

Cr.	
300 cords of wood	450.00
29,942 plants, trees, and shrubs raised in garden and greenhouse	1,961.95
Balance to debit of garden expended in improvement of grounds	2,942.37
Total	5,354.32

Note.—This department has the care of the ornamentation of the grounds, lawns, flowers, shrubs, trees, and fruit.

Dairy account of United States Soldiers' Home, District of Columbia, from October 1, 1896, to September 30, 1897.

Dr.	
Labor, forage, tools, fuel, and repairs	$602.52
Purchase of 7 cows and 1 bull	285.00
Total	887.52

Cr.	
2,701 gallons milk furnished to Barnes Hospital	384.11
90 gallons of milk fed to calves	12.15
Sale of 1 cow	26.00
Balance to debit of dairy	465.26
Total	887.52

The herd on September 30, 1897, consisted of 1 bull, 6 cows, and 1 calf.

E. F. Ladd,
First Lieutenant, Ninth Cavalry, Secretary and Treasurer.

REPORT OF THE INSPECTION OF THE SOLDIERS' HOME

WAR DEPARTMENT, INSPECTOR-GENERAL'S OFFICE,
Washington, D. C., December 10, 1897.

SIR: I have the honor to submit the following report of the inspection of the Soldiers' Home, District of Columbia, made during the week ending November 27, 1897, as required by the act of March 3, 1883. Mr. W. T. Kent, the accountant of the Department, assisted in the examination of the financial affairs of the institution:

The Home was established under the act of March 3, 1851, and opened for use during the same year, the first soldier having been admitted July 25. The reservation contains 502 acres of beautifully rolling and well-shaded grounds, which were acquired at a cost of $326,354.55. The large and imposing structures, especially the two marble buildings occupied as barracks and named after Generals Scott and Sherman, the well-kept hospital, handsome officers' quarters, marble theater and amusement hall, and fine water tower, are in keeping with the picturesqueness of the place, and nothing seems to have been neglected in maintaining or increasing its attractiveness. The cost of the permanent improvements, which has been over $1,100,000, rivals that of the Dayton Home, the largest in the United States, and perhaps in the world; where over five times as many soldiers as here are cared for. The extent of the roads over 20 feet wide is 7½ miles, and under, 2½ miles; all in admirable order; and there are 12½ miles of cobblestone gutters from 14 to 26 inches in width.

This Home also owns a tract of 75 acres on Pascagoula Bay, Mississippi, purchased in 1853 for $5,000, which was occupied as a branch Home for a short time and abandoned in 1855. Its sale was authorized by the act of February 5, 1895. Some place of such specially mild climate would be a commendable addition to the group of Soldiers' Homes.

RECENT IMPROVEMENTS AND CHANGES.

The many beneficial improvements and changes that have been steadily effected from year to year since these inspections were made by the present Inspector-General indicate how much has been done for the welfare and comfort of these deserving soldiers, and accentuate the untiring efforts of the officers of the institution toward making this a model home. A comparison of the conditions some six or seven years ago with the present may serve to illustrate the revolution which has been gradually going on and is still in progress. Among the more notable changes and improvements of recent years, many of which directly affect the health and comfort of the men, may be mentioned the erection of an additional story upon the Scott building at a cost of $86,887, giving room for some 30 or 40 more men; increase in the water supply by connection with the city water mains, placing fire plugs near all buildings, and erecting a water tower of 50,000 gallons capacity, at a cost of $29,000; a marble amusement hall and theater, costing $64,000;

dead house at $3,620; hospital stewards' quarters at $4,229; large iron gateway and lodge at the southern entrance at $3,200, and the erection of a canopy over the fan house at the hospital for the convenience of the convalescing sick. Among the other changes of paramount importance, though more or less inexpensive, the disappearance of bedbugs and other insects; less use of kerosene oil on the floors; scrupulous cleanliness of barracks, hospital, and mess hall; excellent police of the grounds; abolition of foul-smelling cesspools, and improved plumbing; neatness of beds and bedding; better dining-room service by enlarging dumb-waiters and the use of large hand trays; appearance of waiters in white jackets and aprons; substituting refuse cans with covers for the wooden boxes at the kitchen; addition of locker stands, barrack shoes, and mattress covers; increased bathing facilities and requiring a bath once a week; establishment of a small museum for old arms, military relics, Indian curiosities, etc.; extending the contract system; monthly payments for services; abolition of the "slush fund;" deposit of current funds in the United States Treasury under the act of January 16, 1891; prohibition of the sale of intoxicants within one mile of the Home, act of February 28, 1891; gradual discharge of retired soldiers to make room for those more needy; witnessing the issue of clothing by a commissioned officer; extending the brick walks; the organization of a fire company; and the decided reduction of the per capita expense of maintenance, deserve mention. So it seems every department of administration has been affected, and wherever inexpensive beneficial changes could be made, whether suggested as a result of inspections or otherwise, no pains seem to have been spared to effect their inauguration. How different the pleasure of such harmonious inspection might be made if obstruction and objection were thrown in the way of every needed improvement is readily recognized.

The introduction of an electric-light plant with 1,422 lamps, now in progress of installation, which it is estimated will cost about $18,000, promises a cheaper or better service. The expense of gas consumed by the Home has been in the neighborhood of $3,000 per annum and will cease upon the satisfactory operation of the electric plant. Hot-water heating for officers' quarters has been authorized at a cost of $4,000; and they could be further improved by connecting them with the city sewer system, like the other buildings. The electric-light plant at Pacific Branch and Marion Branch cost $10,000 each.

Nearly 3 miles of road have recently been somewhat regraveled. Their general beauty is well known, and their unnecessarily steep grades may have been intentional. A larger acreage is being plowed, and some ground that was formerly cultivated is now seeded with grass. Practically this place is a park, and plowing up a place like Central Park is done only with some sufficient purpose. Gardening, etc., has been tried at this and similar places, and the financial deficit can not be misunderstood, in the long run.

OFFICERS.

The officers of the Home are selected by the President of the United States, and may be taken from the active or retired list, vide sections 1259 and 4816, Revised Statutes, and act of March 3, 1883, section 7. The present incumbents are Brig. Gen. David S. Stanley, governor; Lieut. Col. R. F. Bernard, deputy governor; Lieut. E. F. Ladd, Ninth Cavalry, secretary and treasurer, and Col. W. H. Forwood, surgeon. Two of these officers are on the active and the other two on the retired list. The surgeon alone does not receive any extra compensation from

the Home funds. Lieutenant-Colonel Bernard and Lieutenant Ladd entered upon their duties during the year, having relieved Capt. D. A. Irwin and Maj. R. C. Parker, respectively. The retiring officers have performed their duties with marked zeal, and the improvements and increased economy effected in matters under their immediate supervision have been far-reaching, and deserve recognition; and doubtless their successors will continue the same progressive policy in all that pertains to the welfare of the men. In such an institution there are naturally matters that can be and are being improved.

MEMBERS.

The average number of officers and members present during the year ending September 30, 1897, was 728, which is 40 more than reported for the previous year. The greatest number present was 752 on February 25, 1897, and the lowest, 671 on June 15, 1897; and the total cared for 1,501, against 1,535 the preceding year.

The average number absent was 402, which is an increase of 22 over the number reported for the previous year, mostly on outdoor relief. There were 14 vacant beds in the barracks at date of inspection, and 10 in hospital, and 30 more were reported on hand to be put up if needed. The broad bunk springs and thick hair mattresses and clean sheets present an air of comfort and good care that is most commendable. The age of the members present October 15, 1897, ranged from 24 to 87, and averaged 55.7 years; and their services ran from 2 months to 31 years, with an average of 15.3 years.

The behavior of the men seems to have been good, though the number of infractions against the rules is greater by 22 than for the previous year. There were in all 367 offenses committed by 321 men, of whom 275 offended but once, 36 twice, and only 10 more than twice. Compared with the conditions for the preceding year, there is a noticeable decrease in the number of habitual offenders and a large increase in the number offending but once; the prompt disciplinary measures consist of confinement and labor on roads and grounds, and for repeated or grave offenses, suspension or dismissal. Five-sixths of all offenses committed consist of drunkenness and its corollary, absence without leave and returning with a supply of intoxicants. There is no post exchange on the reservation like those established at the National Home, so purchases must be made in the city, where temptations are numerous; and the mile-limit law is said to have given rise to numerous secret liquor dens, to the detriment of the old soldier and the discipline of the Home.

The system of limiting the men to $8 per month of their pensions while at the Home and to a fixed amount per diem when going on furlough is said to have worked well—a wise restraint in spending money, being as beneficial here as elsewhere.

The members were inspected in the old and present dining room in the main building. They were formed facing inward, about three ranks on each side, and the following statement was received:

Number of inmates present		775
Absent sick	75	
Absent, extra duty	144	
Absent on pass	10	
Absent on fatigue	22	
		251
Present at inspection		524

A large number (111) were without full uniforms, who were awaiting action of the board of commissioners and had been admitted tempo-

rarily for observation or medical treatment. There were occasional indications of some need of cleanliness or repairs of under and other clothing.

AMUSEMENTS.

The subject of amusements and active recreation here, as at the Volunteer Homes, presents a problem not as easily solved as might appear at first blush. This Home has a fine theater; a band; a library and reading room; a billiard hall in the basement of the Sherman building, with 3 billiard, 1 pool, and 2 bagatelle tables; an amusement or smoking room in each of the barracks for cards and other indoor games; and a small museum of old relics, Indian curiosities, etc. Some of the Volunteer Homes seem to be ahead of this one in the matter of amusements, having also deer parks, as at Togus, or animals in cages, as at Santa Monica, or shuffle boards, quoits, boating, and workshops with all sorts of tools. The great need seems to be out-of-door occupation to prevent sedentary habits, or something to set the blood in circulation. Some helpful duty would seem better for most men than being inert.

The theater is a fine building of white marble facing and was completed about a year ago, and it is understood was intended to accord with the very handsome main building. It certainly looks more inviting than the basement as a place of amusement and furnishes considerable pleasure. A part of its basement is used by the Grand Army of the Republic and other associations, and as apartments for employees, and the oldest inmate. Seventy-two performances were given, at an expense of $478.25. Admittance is free to all.

The Home band is a source of pleasure to the old soldiers. It is composed of 17 men, 6 of whom are civilians, and gave 237 concerts, at a cost for the year of $3,235.77, or an average of $190.32 per musician; or a cost of $13.65 per concert. Last year the band was composed entirely of inmates.

The library is a peculiarly constructed and expensive brick building and inadequate for many more books. It contained 6,249 volumes, which is an increase of 175 over the number reported last year, and 34 papers and 17 periodicals are subscribed for. The circulation during the year is reported as 14,080, which gives an average of over 19 books per man. The funds allowed for books might possibly purchase more if there were more accommodations for them. Fiction and history are in greatest demand here, as at the Volunteer Homes. The reading room attached to the library has a seating capacity of only 26 and an average daily attendance of 216; but the museum, which is under one end of the Sherman Building, balancing the billiard room under the other, is also used as a reading room; and between them is a large, rather dark space used for smoking, where a man and a woman have stands set up to vend their wares.

BUILDINGS.

These were generally found in excellent condition. Some were undergoing repairs, and there were somewhat noticeable indications of old leaks hardly to be expected in such expensive buildings. The five structures occupied as barracks were given distinctive names in January, 1889.

The building which was upon the grounds when purchased, and was formerly reserved as a summer residence for the President of the United States, was named the "Anderson Building," after the late Gen. Robert Anderson, in recognition of his work for the establishment of the Home. It is now occupied principally by the band.

The main building, which was the first one erected for occupation by inmates, and is an imposing marble structure with a square tower prominently seen from many directions, was called "Scott Building," in honor of the late Gen. Winfield Scott, who obtained by levy upon the City of Mexico the first funds—some $118,000—for the establishment of the Home, and whose statue, life size, stands upon a knoll to the south, overlooking the city.

The north wing of the main building, also of marble, and completed in 1889, was called "Sherman Building," in honor of Gen. William T. Sherman, who was the first president of the Board of Commissioners after its reorganization in 1883. These two buildings with the annex connecting them are somewhat in the form of the letter H. The Scott Building has rear porches, but the Sherman Building has none.

The brick building west of the library, and most bountifully supplied with comfortable verandas, was called "Sheridan Building" after the late Gen. Philip H. Sheridan, who was president of the board when the building was erected.

The brick building east of the main or "Scott Building" was called the "King Building," after the late Capt. Benjamin King, who was the first secretary and treasurer of the Home and filled that position with marked ability for about thirteen years.

The governor, deputy governor, and treasurer generally accompanied the inspector-general. During the first day the percentage was large of men absent from their bunks in the rooms visited, and most of the other days. The former dining room in the Scott Building, where the inspection of the men took place, offers admirable space that is not fully utilized. A screen of metal network, such as that at the Hampton Home, is far better than closed closets for table ware in such constant use, and might answer for extending the too restricted pantries, which would serve better for hanging up clothes than the present wooden screens. The remainder of this wasted space would answer well for additional innocent occupation or amusement, whether reading or billiards or other games, as there is good light upon both sides. The basement might then have shuffleboards, etc., as they have at the Dayton Home, which is especially desirable in winter, when the opportunity for active occupation is least.

The sergeant-major's office seemed unnecessarily large if room for beds is needed. A bunk bottom or two were found in the Scott Building not fitted as if made for its frame or evidently needing repairs. The system so prominent at the Volunteer Home, of restretching and replacing or repairing wire-woven springs in the bunks seems but little developed, if practiced here at all. The repair of the admirable hair mattresses goes on constantly, and they seem as economical in the long run as they are comfortable, and cleanliness therein prevails. Some mattresses seemed too short for a tall man—only 6 feet—but the last purchased were more, and in most things were generally an improvement on some of the old. The last bedsteads previously bought were all iron, and were also thought very desirable. Iron rollers are not good for washed floors and the latest do not have them.

There were signs of old leaks in this building, but far greater in the Sherman Building; and in both it was said the repairs or pointing or reguttering would probably prevent such leaks during this winter. Again this year the Sherman Building was neat as a pin. Its porcelain-lined tubs, like those in the Scott, were inviting, and over a hundred towels were reported. In the Scott, about two dozen roller and half a dozen hand towels were mentioned, and it was said one of the latter

could be used for a bath in either of the four tubs and then the bather hung it on the heater to dry for the next man. Most, perhaps all, of the men seemed to have several private towels of their own, and few or none of them were entered on the laundry list. This was said to be another illustration of the men doing their own wash in their smaller articles.

The large number of men in this imposing structure might fairly warrant a modern passenger elevator, especially since both water and electricity have been introduced. The added comfort gained by the marked difference between summer and winter clothing is in contrast to those Homes at which only one style is issued the year around.

The remarkably neat, well-kept room on the lower floor of the Sheridan Building does not reflect on the careful cleanliness of the others, but calls for special praise; and the painting in progress simply accentuates the care habitually taken of this specially comfortable building, with its full complement of porches. Seven seemed as many men as were in any of its rooms. At the Volunteer Home lockers are usually set between the beds, some with a looking-glass in a drop lid to serve as a table and with three shelves; but the lockers here are locked boxes placed on a stand which shelters the shoes. The 3-foot beds, with hair mattresses, reddish coverlids, and cleanly sheets and pillow slips, looked very comfortable. Some of the coverlids were worn through the red exterior and some seemed to need washing. The contract seems remarkably cheap for laundering such heavy articles, only 3 cents; and its prices generally seemed remarkably reasonable, especially compared with my first inspection. Perhaps a lighter and more washable and serviceable material might be adopted, though fair uniformity should prevail. The bedsteads were of unequal heights, and some vivid greens or blues mixed with the reddish counterpanes. The upper bathroom, with only two tubs, was rather dark, and the rough, unlined iron tubs less inviting than porcelain, but all immaculately clean, though there were said to be only twelve public towels to over 140 men, and hot water only on Wednesday, and possibly Thursday, for the ten tubs. The laundry list indicated rather more sheets than of the several articles of underclothes, and the same curious withholding of socks from the laundry, which were said to be washed by the individuals; but the number of sheets is the basis of the contract price per man.

The basement space formerly used as an amusement hall is liberated by the erection of the theater building; the remainder being occupied for a barber shop, bookbindery, storage, etc. The places for assemblage or recreation besides the theater and library are usually in the basements; the Scott and King buildings each having a smoking room besides those already mentioned. The remainder of the basement of the main building is used for dormitory for police, laundry room, prison room, latrine, storerooms for clothing, subsistence, and men's private effects, bake ovens, and kitchen. The bread seemed to be particularly good. The acceptability and improvement in the quality of some articles of clothing and of food are pronounced, though some hardly seemed up to army standard.

On a dark day the dark rooms in basements are especially obscure for reading or recreation, and from the occasional crowds, though commodious, may seem somewhat limited. The gas jet in the billiard room accentuated the prevailing gloominess in its darker corner.

The clatter from cleaning up parts of the tables and gathering the dishes at supper while some of the men were eating was said to be unavoidable, though it is in contrast to the best-conducted messes at the volunteer Homes, and this hall is large enough to seat all inmates

simultaneously. The supper consisted of baked sweet potatoes, coffee, bread, and oleomargarine.

In the King Building new flooring, 3 inches wide downstairs and 2½ upstairs, was being laid upon the old. The latter is preferable where floors are supposed to be kept as perfectly as soldiers should. The front room upstairs was said to be the largest dormitory in the institution, and had ten beds in it. The mattresses were too short, one bunk having pieces of scantling, trousers, etc., to bring the space up to a level under the pillow. The ventilator tried here and elsewhere worked well. The smoking room was full, as usual, with card players, and seemed the only one that was, and lightest of all. The upholstery and hair picking are in this basement and the room where the men sleep on straw without wire-woven springs. One of the men was said to have expressed his desire to injure the officers before them.

The neighboring latrine, with nearly thirty bowls, is a marked improvement in construction over what it was as a mere roofed and walled pit ten years ago; and it is said to be washed out once a week and swept often. It might have been still tidier.

There is some possibility of erecting a more effective and ornamental conservatory, whether near the Eagle Gate or Scott Building is perhaps not determined upon. The mere propagating houses have grown considerably, and it hardly seems necessary to confine decorative and flowering plants simply to those which grow in the open air. The Dayton Home shows how effectively plants can be grown both in water and under glass.

Perhaps it would be well to get rid of the merely temporary and combustible buildings about the stable and remove it to some less prominent site. It is unnecessarily near the barracks, and is unsightly in such proximity to these crowded buildings, with which it does not at all accord.

Some changes have taken place in the accessories and repair of the steam plant, and some extension of its building for the electric plant was in progress.

At one of the gate houses the cellar leaked; others lacked repairs, as also did certain outhouses. One gate house was a single room. Some other buildings about the farm were occupied with families and some had several occupants, and in some of them were beds and bedding of the Home, not always in the best condition, though generally extremely tidy.

DISBURSEMENTS.

The accounts and disbursements of the treasurer were inspected from November 20, 1896, the date of last inspection, to November 20, 1897. The following is a summary:

HOME FUND.

Balance on hand November 20, 1896		$17,898.86
Received from United States Treasury	$201,490.20	
Received from sales	1,516.06	
Received from collections	3,731.05	
Received from pension fund	1,248.33	
Received from canceled check	21.60	
		208,007.24
Total to be accounted for		225,906.10
Disbursed, as per vouchers		205,445.20
Balance on hand November 20, 1897		20,460.90

PENSION FUND.

Balance on hand November 20, 1896		46,159.38
Received from pension agent		84,876.88
Total to be accounted for		131,036.26
Disbursed to pensioners	$88,372.16	
Transferred to Home fund	1,248.33	
		89,620.49
Balance on hand November 20, 1897		41,415.77
Total balance November 20, 1897		61,876.67
Distributed as follows:		
United States Treasurer	$61,182.69	
Assistant treasurer, New York	655.51	
Cash on hand	38.47	
Total		61,876.67

The laws governing the receipt and disbursement of public money require it shall be kept on deposit and disbursed by checks in favor of the person entitled to the payment. The observance of these laws would render unnecessary the drawing of checks for the cash box, the keeping of cash on hand, and the payment to the treasurer of "omnibus vouchers." Compared with the monthly disbursement the amount on deposit also appears unnecessarily large.

At the close of the year there were 836 pensioners on the rolls, of whom 560 were present at the Home. The amount paid these pensioners for the last quarter was $23,666.94, and averaged $42.26 per man. There are 2 who receive $50 and $75 each per month; the other 834 receive from $6 to $30 each. Three hundred and fifty-nine pensioners have balances to their credit, of whom 4 have $1,000 or over each, 15 between $500 and $1,000, 105 between $100 and $500, and 235 less than $100 each, the total amounting to over $40,000, which seems to be lying idle. In active service, deposits with the Government are encouraged by the payment of interest thereon, and it seems these old soldiers who have given the best part of their life to the Government should fare no worse in their declining years. Six of the pensioners, with a total saving of $4,309 to their credit, have been transferred to the Government Insane Asylum. Should this not be covered by the general law and appropriations, as the transfers from the Volunteer Home are.

The accounts shown at inspection should be the only ones in use, and are a very decided improvement over the unofficial type that prevailed some years ago. The office of the treasurer was in good condition, and the new treasurer, Lieutenant Ladd, seems to be an efficient, energetic, and hard-working officer.

The annual income of the Home accrues from the monthly contribution of 12½ cents from enlisted men; fines and forfeitures of enlisted men by sentence of courts-martial; amounts forfeited by deserters; unclaimed amounts due the estates of deceased soldiers, and interest at 3 per cent on the permanent fund, which now amounts to over $2,700,000, and has increased over $1,000,000 in the past ten years.

The following statement shows the transactions affecting the permanent fund during the past three years:

	1895.	1896.	1897.
Balance September 30	$2,574,036.79	$2,690,042.83	$2,711,124.52
Credit settlements	188,006.04	145,700.49	134,256.23
	2,762,042.83	2,835,743.32	2,845,380.75
Withdrawn for current expenses	72,000.00	124,618.80	107,782.80
Balance September 30	2,690,042.83	2,711,124.52	2,737,597.95

Although there has been a constant reduction since 1894 in the credit settlements—receipts from fines, forfeitures of deserters, monthly contributions of enlisted men, etc.—which, during the past year, were over $60,000 less than in 1894, the permanent fund on deposit in the United States Treasury has continued to grow steadily.

The following are the receipts taken up by the treasurer for the year ending September 30, 1897:

Balance on hand		$7,925.25
Received from permanent fund		107,782.80
Received from interest fund		81,449.36
Received from posthumous sources		966.23
Received from pension fund		1,248.33
Received from sales:		
Current expenses	$522.03	
Household	222.00	
Subsistence	482.11	
Clothing	136.42	
Hospital	27.50	
Farm	69.89	
		1,459.95
Received from other sources		2,278.50
Total from all sources		203,110.42

The expenditures for the same period were:

Current expenses	45,438.07	
Subsistence	31,316.97	
Clothing	9,001.21	
Household	24,123.70	
Hospital	16,807.71	
Transportation	516.79	
Construction	27,180.30	
Repairs	7,757.62	
Farm	4,860.43	
Outdoor relief	27,843.48	
		194,846.28
Balance September 30, 1897		8,264.14

The average cost per capita for the year is reported as follows:

Subsistence	$57.48
Clothing	14.34
Household	16.50
Current expenses	44.28
Hospital	27.20
Farm	10.60
Repairs	6.90
Total per capita	177.30

Compared with last year there is a decrease of the per capita in clothing, household, and current expenses and an increase in subsistence, hospital, farm, and repairs, and there is an increase in the total

cost of maintenance per man of $5.59, due in a large measure, it seems, to the damage caused by the hurricane of September 29, 1896. The per capita at the Volunteer Homes is lower than here, but they have a much greater membership and post and other funds to share expenses and no such extensive parking to care for; and this is regarded as a permanent institution. It may be well at some time to consider which (during the year of probable occupation) obtains most per dollar expended.

In the above statement is not included the average daily number of members (336.58 men, or about 30 per cent of average present and absent, which numbered 1,126) on outdoor relief during the year, to whom a total of $27,843.48, or an average per man of $82.725 for the year was paid, and adding them, the cost of maintenance per capita becomes $147.29. The monthly payments to these beneficiaries ranged from $2 to $8, and averaged $6.894 per man. The number on outdoor relief at the close of the year was 342, which is an increase of 16 over the number reported a year before, of whom 86 were nonpensioners and 256 received pensions ranging from $6 to $30 per month. Among them are 146 Mexican war survivors and 52 with a service of twenty-five years or over. The system of outdoor relief in vogue here could, perhaps with some modifications, be applied advantageously to the Volunteer Homes, where many ask for it and where something seems needed, especially in winter, to reduce the excessive overcrowding or aid deserving old soldiers who can not now be admitted. The following table, approximately indicating the status during the past five years, is condensed and may serve as an illustration:

Branches.	1893.	1894.	1895.	1896.	1897.
Central	$159.07	$160.96	$127.82	$125.00	$118.38
Northwestern	160.91	162.80	149.79	135.01	122.26
Eastern	187.74	158.56	144.16	138.52	133.90
Southern	152.90	132.78	113.54	133.65	120.00
Western	168.66	145.55	127.96	132.08	122.85
Pacific	303.31	169.23	161.67	166.55	152.42
Marion	201.11	146.65	152.36	169.73	165.56
	172.91	146.43	135.28	137.26	128.39

EMPLOYEES.

The following statement, showing the number of employees and amount paid them for services during the year, was received:

3 officers	$3,079.34
28 noncommissioned officers	4,802.60
186 members	24,280.40
58 civilians	27,260.35
275	59,422.69

Compared with the statement received last year, there is an increase of 5 in the number of employees and over $4,000 in the amount paid for services, and while the per cent of total expenditures paid for services is larger than in 1896, the ratio of employees to average membership has decreased, as well as the average paid for services per inmate. The following shows the conditions for the past six years:

	1892.	1893.	1894.	1895.	1896.	1897.
Per cent of total expenses paid for services	24.6	23.7	31	34.5	26.3	28.3
Ratio of employees to average membership	28.6	29.7	37	40.7	39.2	37.8
Average per inmate	$64.87	$70.07	$79.44	$81.83	$80.08	$75.68

Would it not be more in accord with the law to defer the payment of all salaries until due?

The extremes and averages of the daily compensations are shown in the following table:

Daily pay of—	Maximum.	Minimum.	Average.
Officers[a]	$3.82	$2.50	$3.16
Noncommissioned officers	1.67	.33	.47
Members	1.00	.17	.37
Civilians	5.00	1.25	1.32

[a] Not including the surgeon, who receives no extra compensation in addition to Government pay.

Comparing the averages with those reported by the Volunteer Homes, it seems that those of officers, noncommissioned officers, and civilians is lower here, and that of members is higher than at five of the Branch Homes.

From ten to twenty men per day performed light labor about the grounds without pay, usually at raking leaves, protecting flowers and shrubbery, assisting in planting young trees, etc.; but obviously the excellent care given these extensive grounds requires and receives more than these temporary details.

SUPPLIES.

Property and stores of all kinds were in excellent condition, and evidently received careful attention. The current supplies on hand seemed to be kept generally near a minimum, and on September 30, 1897, consisted of subsistence stores valued at $484.11; quartermaster stores, $2,284, and clothing, $2,877.98. There were condemned during the year some 5,145 articles, originally valued at $1,802.83—about $2.48 per man. The governor has charge of clothing, and the deputy governor usually superintends the issue of the same to the men and acts as inspector to condemn property.

Commissary stores for regular issue are turned over to the commissary sergeant, and extra issues to the kitchen sergeant. So it seems property responsibility is divided, though excessive accumulation of property is avoided as much as possible, and purchases for current use are made as needed. The following summary from the return of property and tools for the quarter ending September 30, 1897, shows the number of articles for which the treasurer is accountable, and may give an idea of how scattered some of the property is at so large an institution:

Articles pertaining to—	Number.	Articles pertaining to—	Number.
Farm	478	Painter	247
Ambulance	12	Dairy	118
Book bindery	35	Stables	216
Boiler house	208	Roads and grounds	275
Pump house	64	Garden and grounds	16,958
Carpenter	311	Tinner	32
Blacksmith	104		
Plumber	85	Total	19,188
Saddler and upholsterer	45		

The clothing issued to the inmates seems of fairly good quality and the allowance more than liberal. Perhaps the shoes were poorest, at less cost than $1 per pair. The amount purchased during the year was valued at $8,823.49, which is slightly over $12 per man. There is no repair shop for mending clothes or shoes maintained by the Home, and

this expense is borne by the men. Clothing here is not condemned when issued, though held to be Home property, but is dropped from the accounts, and cast-off clothing is issued to needy temporary inmates, or, when no longer fit for wear, used for police purposes, as mops, etc. At the Volunteer Homes it is sold as rags at fairly good prices, the receipts from this source for the past year amounting to over $6,000. The quality and the economical use of clothing deserve attention. The law requires that a suitable uniform shall be furnished to every inmate of the Home without cost to him. Does not this include pensioners of whatever rate?

There were no complaints concernimg cooking and quality or quantity of food, and dining hall and kitchen were in good order; the former was being painted. The bill of fare for the week ending November 14, 1897, is shown in Exhibit M, and can be compared with the fare at army messes or the Volunteer Homes. The following table shows the amount of food consumed at the Home as reported for the months of December, 1896, and June, 1897:

Month.	Mess hall.						Hospital.					
	Amount issued.	Cost.	Average number of men present.	Amount per man.	Cost per pound.	Cost per man.	Amount issued.	Cost.	Average number of men present.	Amount per man.	Cost per pound.	Cost per man.
	Lbs.			*Lbs.*			*Lbs.*			*Lbs.*		
December ...	3,402	$95.55	631	5.39	$0.028	$0.151	479	$20.86	79	6.06	$0.044	$0.264
June.....	2,939	100.07	619	4.75	.034	.161	356	17.74	66	5.39	.050	.269

To prepare, cook, and serve the meals at the main kitchen and mess hall requires some 7 men for the kitchen and 29 for the dining room. Some 12,647 meals were given to transients or destitute ex-soldiers. The per cent of crockery reported broken is: Coffee bowls, 17.4; dinner plates, 10.4; soup plates, 11, and butter plates, 17.7, and is much lower than reported at the Volunter Homes. Swill and garbage are not sold here, as at other Homes, but are given to an inmate for removing.

LAUNDRY.

This Home has no laundry plant like the Volunteer Homes, and the washing is done under contract by outside parties. The pieces washed during the month of September were 7,745 regular washing and 1,041 extra washing. Each man is allowed to send weekly one change of underclothing, for which the Home pays 16 cents per month, or $1.92 per year, under the present contract. The total paid for laundry work, regular and extra, during the past year was $1,698.58, or about $2.35 per man. The contract prices in force for the current year are shown in Exhibit F, and are a great reduction from the prices paid some years ago, as shown in the following summary:

Contract prices of laundry work.

Year ending—	Amount per man per month.	Year ending—	Amount per man per month.
June 30, 1893.....	$1.00	June 30, 1896.....	$0.20
June 30, 1894.....	.50	June 30, 1897...	.20
June 30, 1895.....	.245	June 30, 1898.....	.16

With so large a reduction in so short a time it seems problematical whether the establishment of a laundry plant at this Home would be more satisfactory. The contract price, as shown in the above statement, is 16 cents per man per month, and the number of men for which payment is made is based on the number of bed sheets sent weekly, without reference to the number of pieces of underclothing, provided no one has more than one piece of each kind; so it seems the great number of men—about 50 per cent—who do part of their own washing or have it done elsewhere could have had it done at the contractor's without increasing the expense to the Home, as the bed sheets are always sent, and only a small percentage of the men send their full allowance to the laundry.

WATER SUPPLY.

Since the connection of the water pipes with the city water system and the erection of a water tower of 50,000 gallons capacity in 1893, supplementing the former supply from wells and springs on the grounds, the supply seems to have been satisfactory in every respect, and has materially added to the facilities for protection against fire. With the increase in the supply, fireplugs were placed near all the buildings, and rising pipes with hose in the hospital, as it had none. The protection against fire, consisting of water plugs, hose and reel company of 50 men, rake and ax detail of 100 men, and fire buckets on each floor, except the Sherman Building, is reported adequate and in good condition. There were no fires during the year.

FARM.

The farm of the Home comprises 240 acres under cultivation, of which 40 are used for vegetable production and the remainder for hay. The valuation of products for the year was about $2,000 more than for the previous year. The farm report shows a credit of $2,496.32 in vegetables, principally potatoes, cabbage, tomatoes, parsley, corn, etc., and $3,000 in hay at $10 per ton, and an expenditure of $4,860.43 for labor, fuel, fertilizers, implements, seeds, and repairs, leaving a balance in favor of the farm of $635.89, exclusive of $665 worth of vegetables estimated to have been still in the ground when the report was made. Apparently the farm has done well, though the values are merely estimated, and it did not produce sufficient for the mess table, as $2,178.20 were expended for the purchase of additional vegetables. The farm keeps 4 wagons and 3 carts, of which 2 were in need of repairs, 3 horses, 4 mules, and 6 milch cows, and employs 5 men. The yield of milk was 2,791 gallons, which at the rate of 14 cents per gallon, the present contract price, would amount to $390.74. Since the killing of the entire herd of some 50 or 60 cows in 1893 on account of tubercular infection, the Home authorities have been compelled to purchase their milk supply, and, it is understood, desire another herd, and possibly the few cows now on the farm and bought during the year may form the nucleus of another herd. The farm stock on hand September 30, 1897, was valued at $800. Farming or dairy work on such valuable though not specially productive land is not usually nor formerly here a marked financial success.

The farm buildings are nearly all in need of painting or some minor repairs.

The garden is charged with the care and ornamentation of the grounds, flowers, and shrub trees. It employs about 8 men and expended during the year for labor, fertilizers, seeds, tools, fuel, and implements $5,354.32,

and claims credit for $450 on account of 300 cords of wood, and, $1961.95 on account of some 29,000 plants, trees, and shrubs raised in the garden and greenhouse. Of course, a deficit in this department is readily understood. A conservatory in keeping with the other features of the Home seems needed. This account might more properly be called the "Lawn account," as no fruits seem to be produced and all items charged to it relate to the care and ornamentation of the grounds.

HOSPITAL, ETC.

The hospital was in excellent condition, quite as much as it was last year. The dingy look of some of the worn red bedspreads in the other dormitories elsewhere and the vivid blue and green of others made the seemly appearance of the white counterpanes here all the more noticeable, and it was found that some of them had the American eagle and a date early in the seventies woven into them, showing how long they last with proper care. The iron bunks were not uniform, varying both over and under the usual 3-foot bunk, nor did they in all cases fit the wire-woven spring frame. It was understood the milk now came from the new herd and was charged at 15 cents a gallon instead of 10 cents during summer and 14 cents during winter months, according to last contract, or 17.8 cents, as it was charged when the Home owned a herd before. Far more articles than formerly are now obtained from the medical supplies of the Army. Considerable repairs and painting are in progress here as elsewhere, including the introduction of electric lighting. The surgeon was not seen, nor his assistant, and a large percentage of the patients were not seen at their bunks.

It is understood the design of this hospital was by Dr. Billings and was intended to be a model. Certainly the finely windowed ward, with only two rows of beds, and most comfortable-looking porches, appears more satisfactory than the large, square dormitories without windows opposite each other, and with row after row of bunks running entirely around the room, one row within another, found in dormitories elsewhere, and may possibly meet with high favor from some who do not use them.

There are in all 85 beds for patients, and 79 were occupied at the close of the year against 76 at the previous report. The average number of daily sick during the year has been 75.9 in hospital and 6.3 at sick call, which is a slight decrease from the average for the preceding year. The following are the principal diseases and percentage of each:

Chronic: Rheumatism, 8.31; tuberculosis, 6.69; asthma, 3.69; bronchial catarrh and heart disease, each 3.46; epilepsy, 3; senile debility, 2.77; cancer, 1.84; locomotor ataxia, 1.62, and pneumonia, 0.69

Acute: Alcoholism, 8.31; malarial fever, 2.54; indigestion and diarrhea, each 2.07; influenza, 1.62, and cholera morbus, 1.38.

Surgical: Wounds, 1.62; fractures, 1.38; abscesses, sprains, and ulcers, each 1.15, and hernia, 0.92.

The acute diseases reported seem to be principally disorders of the digestive organs. Quite a reduction is noted in the percentage treated for acute alcoholism. The principal diseases of local origin are influenza and malaria, of which there were in all 18 cases against 26 for the previous year. There were no infectious or contagious diseases during the year. The total number of cases treated was 2,724, with an average of sixty-four days for each hospital case and of one day for each sick-call case. These figures are less than reported last year. There were 357 patients admitted to the hospital and 133 discharged as cured, and 54 deaths occurred against 67 for the previous year, giving a death

rate per 1,000 present and absent of 47.79, which is less than the general rate of the National Home, but exceeds that at two of its Branches. Thirty deaths occurred in the hospital, 2 elsewhere on the reservation, and 22 outside of the Home. The causes were: Natural, 49; suicide, 4; and accident, 1.

The dead here, as at the Hampton Home, are buried at the neighboring national cemetery, which seems better than to establish and maintain local graveyards. The coffins, which are made at the Home shops at a cost of $6.12, were hardly up to the best successes at the National Home either in design or price. There were 38 members and 7 ex-members buried at the cemetery at a cost to the Home of $6.42 per man; and an allowance of $25 is made for outside funerals, the total expended for that purpose amounting to $350.

Insane members are cared for at the hospital in the general wards, or, if necessary, in two small barred isolation rooms, or are sent to the Government Hospital for the Insane if they can not be cared for here. There were 24 insane members during the year, of whom 20 were considered permanently affected, and 3 were sent to the asylum.

Included in the annual expenses of this Home is the item of $3,976.42 paid for maintenance of its insane members at the Government Hospital for the Insane. Should not this Home be relieved of this charge, as at the National Home, by including the necessary amount in the appropriations for the Hospital for the Insane with appropriate legislation?

The blind also seem well cared for and are daily read to by a man employed for that purpose. There were 3 totally blind, and 6 with impaired eyesight rendering them unable to read.

Hygienic conditions are well maintained, and sick list and death rate have decreased. For extra diet there was expended $3,126.91, which is more than at several of the Branch Volunteer Homes with a larger sick list.

The expense for medicines and druggists' supplies of all kinds was $1,348.91, which amounts to $1.85 per capita and is 17 cents less than for the preceding year, and about 29 cents less than reported for the National Home. The medicines most used during the year were cod-liver oil, 10 gallons; iodide of potash, 20 pounds; extract cascara sagrada, 6 pounds; rochelle salts, 25 pounds; epsom salts, 15 pounds; cathartic pills, 15,000; sulphate of quinine, 40 ounces; bismuth subnitrate, 5 pounds; sulfonal, 6 ounces, and compound licorice powder, 5 pounds.

The number of hospital employees remains the same as that reported last year. Their average compensation was $203.34 per man.

The card system for keeping the hospital history of the men seems to work well here, though it is not in use in the National Home, and is commended for its simplicity and the readiness with which it responds to all demands.

Attention is invited to the accompanying exhibits, which give much detailed and useful information on various matters.

In closing this report, it is recommended that the fiscal year for which the Home renders its reports and accounts, September 30, be changed to June 30, which is the customary line of demarcation of the annual transactions of governmental and other institutions. This seems to be the more necessary here in order to more readily and regularly get these reports, whose publication is required by law, submitted and printed among the earliest, instead of among the latest.

Respectfully submitted.

J. C. BRECKINRIDGE,
Inspector-General.

The SECRETARY OF WAR.

LIST OF EXHIBITS.

A.—Field return of the inmates, October 15, 1897.
B.—Recapitulation of expenditures from October 1, 1896, to September 30, 1897.
C.—Amount paid civil employees during September, 1897.
D.—1. Statement relative to members on outdoor relief.
2. Annual report of members receiving outdoor relief, September 30, 1897, rates of relief, pensions, etc.
E.—Statement showing the number of inmates present October 15, 1897, with length of army service, also their ages, and the number of pensioners and rate of pension.
F.—List of contracts for supplies and services, September 30, 1897.
G.—Amount expended on officers' quarters and permanent buildings from October 1, 1896, to September 30, 1897.
H.—Garden account from October 1, 1896, to September 30, 1897.
I.—Farm account from October 1, 1896, to September 30, 1897.
K.—Vegetables furnished Home and hospital mess from farm for the year ending September 30, 1897.
L.—Vegetables purchased in addition to those received from the farm for the year ending September 30, 1897.
M.—1. Home mess bill of fare for the week ending November 14, 1897.
2. Subsistence stores consumed in the month of December, 1896.
3. Subsistence stores consumed in the month of June, 1897.
N.—1. Clothing washed during the month of September, 1897.
2. Extra washing done during the month of September, 1897.
O.—List of crockery in daily use during the year ended September 30, 1897, with per cent of breakage.
P.—Number of horses and mules owned and employed September 30, 1897.
Q.—Hospital diet, special and general.
R.—List of medicines on hand March 31, 1897, and six months' supply received April 3, 1897.
S.—Statement showing cost per capita at the Volunteer and United States Soldiers' Home, and cost of outdoor relief at the latter for eight years.

A.—*Field return of the inmates October 15, 1897.*

Present for duty:	
Governor	1
Deputy governor	1
Secretary and treasurer	1
Surgeon	1
Hospital steward	1
Sergeants	18
Corporals	6
Privates	292
Sick:	
Noncommissioned officers	
Privates	79
Extra duty:	
Sergeants	1
Privates	150
Temporarily admitted	102
Invalided privates	95
Total	744
Aggregate	748
Absent:	
On outdoor relief	341
Insane asylum	18
Noncommissioned officers	1
Privates (sick, 1)	44
Total	404
Present and absent:	
Total	1,148
Aggregate	1,152

Present distributed among the buildings as follows:	
Scott Building[1]	229
Sherman Building[2]	118
Sheridan Building[3]	143
King Building[4]	86
Anderson Building[5]	33
North gatehouse	2
Eagle gatehouse	2
West gatehouse	1
South gatehouse	1
Southeast gatehouse	1
Whitney avenue gatehouse	1
Marble Hall	9
Married men at old farmhouse	3
Married men who sleep outside	7
Hospital	108
Total inmates present	744
On outdoor relief (beneficiaries)	341
In insane asylum, inmates	18
On furlough, inmates	44
Absent, sick, inmates	1
Total	404
Total inmates present and absent:	
Permanent inmates present and absent	695
Temporary inmates present and absent	112
Beneficiaries receiving outdoor relief	341
Total	1,148

D. S. STANLEY.
Brigadier-General, Governor.

[1] With bedroom space of 271,990 cubic feet; 1,187.7 cubic feet per man.
[2] With bedroom space of 214,664 cubic feet; 1,819 cubic feet per man.
[3] With bedroom space of 152,058 cubic feet; 1,063.3 cubic feet per man.
[4] With bedroom space of 106,594 cubic feet; 1,239.5 cubic feet per man.
[5] With bedroom space of 55,874 cubic feet; 1,693.1 cubic feet per man.

B.—*Recapitulation of expenditures from October 1, 1896, to September 30, 1897.*

Repairs to officers' quarters	$431.45
Compensation of the governor, deputy governor, treasurer, and clerk to the board of commissioners	4,279.34
Transportation furnished to discharged soldiers en route to the Home, to be refunded to the quartermaster's department	516.79
Fuel for the Home	9,802.44
Expenses of the hospital, for medicines, medical stores, spectacles, false teeth, material for coffins, etc	1,975.58
Expenses of the hospital for mess and kitchen purposes and all running expenses, including compensation to inmates on duty and pay of civilian employees	14,832.13
Refunded to claimants as heirs of deceased soldiers	1,352.94
Refunded to claimants as heirs of deceased inmates	1,304.35
Clothing for inmates	9,001.21
Repairs to Home bakery	3.12
Farm, garden, and dairy utensils, seeds, guano, manure, cultivation of garden, ornamentation of grounds, pay of farm, garden, dairy, and other employees	19,636.61
Subsistence stores and ice, including special diet for the sick	31,316.97
Bedding for inmates, bedsteads, blankets, upholsterers' materials	339.34
Mess and kitchen utensils and all other articles, except bedding, for the Home	1,301.87
Material for general repairs to buildings, repair of roads and fences, purchase and repairs to harness, vehicles, and purchase of mechanical tools	3,921.13
Forage and medicines for Home animals, articles used in stables	766.14
Expenses of the library, governor's and treasurer's offices, post-office box rent, stationery, etc., for commissioners' office, freight, telegrams, and amusements	1,783.51
Incidental expenses, rental of telephone, hack hire, traveling expenses, professional services, and expenses of the Home chapel	514.16
Religious services	1,980.00
Laundry work for the Home	1,698.58
Compensation and monthly allowances to inmates nonpensioners on duty at the Home, except inmates on duty at Barnes Hospital	21,578.52
Commutation to inmates of the Home residing outside	27,843.48
Gas for the Home, including rental of gas regulators	2,353.80
Funeral expenses of members of the Home residing outside	350.00
New buildings: New amusement hall, heating and ventilating same, increasing the capacity of the boiler plant, labor and material constructing an electric plant	27,180.30
Permanent improvements: New fences, repairs to bridges, lamp-posts, gas lamps, paving, sewerage, etc., repairing outside of Barnes Hospital and third floor inside, repairs to steam pumps, boiler house, increasing water supply of farm stables, boiler and green houses	3,921.10
Board and medical treatment of members of the Home in Government Hospital for the Insane	3,976.42
Purchase of animals—cows and horses	885.00
Total expenditures	194,846.28

E. F. LADD,
First Lieutenant, Ninth United States Cavalry,
Secretary and Treasurer.

C.—*Amount paid to civil employees during September, 1897.*

One clerk to board of commissioners	$100.00
One clerk to secretary and treasurer	100.00
J. B. Nichols, clinical assistant to attending surgeon	100.00
Rev. J. A. Cunnane, religious services and services of choir	65.00
Rev. G. H. Johnston, religious services	50.00
Rev. Gustav Facius, religious services	25.00
Lulu Facius, services as organist and in choir	25.00
Emily Grant, hospital matron	10.00
One farm overseer	50.00
Seven farm laborers	208.50
One gardener and florist	50.00
Eight day laborers in garden and grounds	277.00
One driver of dairy wagon	19.00
One assistant in Home dairy	15.00
One plumber	85.00
One blacksmith	75.00
One chief engineer, boiler house	75.00
One assistant engineer	60.00
Three firemen, at $33 each per month	99.00
One engineer, pump house	50.00
One chief cook	50.00
One assistant cook	23.33
One chief baker	50.00
One assistant baker	45.00
One ambulance driver	20.00
One tinner	75.00
Twelve men employed in the construction of an electric plant	922.62
Total	2,724.45

E. F. LADD,
First Lieutenant, Ninth United States Cavalry,
Secretary and Treasurer.

D[1].—*Statement relative to members on outdoor relief.*

Average number for one year from October 1, 1896, to September 30, 1897	336.58
Total amount paid for outdoor relief during the year ending September 30, 1897	$27,843.48
Average amount paid per man for one year	$82.7247
Average amount paid per man for one month	$6.8937
Highest amount paid per man for one month	$8.00
Lowest amount paid per man for one month	$2.00

E. F. LADD,
First Lieutenant, Ninth Cavalry, Secretary and Treasurer.

D[2].—*Annual report of members receiving outdoor relief September 30, 1897, rates of relief, pensions, etc.*

Receiving outdoor relief:	
$8 per month	284
$4 per month	2
$2 per month	56
Total	342
Receiving outdoor relief September 30, 1896	326
Net gain during the year	16
Nonpensioners receiving outdoor relief	86
Receiving pensions:	
$6 per month	63
$8 per month	39
$10 per month	5
$12 per month	117
$14 per month	5
$16 per month	4
Receiving pensions—Continued.	
$17 per month	11
$20 per month	1
$22 per month	1
$24 per month	6
$25 per month	1
$30 per month	3
Total nonpensioners	86
Total pensioners	256
Total	342
Of this number there are Mexican war survivors	146
Men who have served twenty-five years or over	52
Of this latter number there are nonpensioners	9

Fifteen members on outdoor relief have died since date of last report.

Ten members were dropped from outdoor relief after June 30, 1897, in compliance with resolutions of the board of commissioners dated June 19, 1891, July 17 and August 21, 1897.

E. F. LADD,
First Lieutenant, Ninth Cavalry, Secretary and Treasurer.

E.—*Statement showing the number of inmates present October 15, 1897, with length of army service; also the number of pensioners and rate of pensions.*

ARMY SERVICE.

Length of service.	Number of men.	Length of service.	Number of men.	Length of service.	Number of men.
2 months	1	7 years	9	21 years	77
4 months	1	8 years	15	22 years	86
5 months	1	9 years	15	23 years	42
6 months	2	10 years	9	24 years	23
7 months	2	11 years	15	25 years	29
8 months	1	12 years	12	26 years	21
9 months	3	13 years	22	27 years	10
11 months	1	14 years	16	28 years	9
1 year	26	15 years	17	29 years	1
2 years	23	16 years	19	30 years	1
3 years	47	17 years	13	31 years	1
4 years	14	18 years	20		
5 years	36	19 years	35	Total	744
6 years	17	20 years	102	Average number years	15.30

E.—*Statement showing the number of inmates present October 15, 1897, etc.*—Continued.

AGE OF INMATES PRESENT OCTOBER 15, 1897.

Age.	Number of men.	Age.	Number of men.	Age.	Number of men.
24 years	3	45 years	8	65 years	14
26 years	2	46 years	15	66 years	16
27 years	3	47 years	12	67 years	16
28 years	1	48 years	28	68 years	14
29 years	6	49 years	28	69 years	11
30 years	3	50 years	38	70 years	12
31 years	6	51 years	38	71 years	17
32 years	5	52 years	30	72 years	11
33 years	2	53 years	39	73 years	9
34 years	2	54 years	27	74 years	7
35 years	7	55 years	30	75 years	8
36 years	5	56 years	19	76 years	2
37 years	2	57 years	33	77 years	4
38 years	1	58 years	13	78 years	3
39 years	5	59 years	28	79 years	3
40 years	5	60 years	40	80 years	3
41 years	7	61 years	27	84 years	1
42 years	4	62 years	18	87 years	1
43 years	6	63 years	18		
44 years	10	64 years	18	Total	744

Average age of inmates present October 15, 1897, 55.7.

PENSIONS.

Rate per month.	Number of men.	Rate per month.	Number of men.	Rate per month.	Number of men.
$6 per month	88	$16 per month	20	$50 per month	1
$8 per month	98	$17 per month	58	$72 per month	1
$10 per month	45	$18 per month	1		
$12 per month	195	$20 per month	2	Total	565
$12.50 per month	1	$24 per month	11		
$14 per month	37	$30 per month	7		

Average monthly pension, 13.43\frac{8}{10}$.

D. T. STANLEY,
Brigadier-General, Governor.

F.—*List of contracts for supplies and services, September 30, 1897.*

Telephone service, Chesapeake and Potomac Telephone Company, metallic circuit, per annum		$240.00
Fuel:		
White ash furnace coal	per ton	4.55
White ash stove coal	do	5.05
Cumberland coal	do	2.35
Forage:		
Oats	per hundred weight	.87
Shelled corn	do	.67
Bran	do	.60
Flour	per barrel	4.10
Laundry work:		
Per man (the laundried articles for each man per week consist of 1 sheet, 1 pillowcase, and 1 complete change of underclothing per man per month)		.16
Billiard-table covers	each	.02
Blankets and trousers, mattress covers	do	.04
Summer coats	do	.05
Aprons	do	.01
Men's white caps and bedspreads	do	.03
Table covers	do	.01½
Sheets and pillowcases	do	.00¾
Roller towels	per 100	.65
Hand towels	do	.30
Napkins	do	.15
Ice	per hundred weight	.27
Milk:		
From May 1, 1897, to October 31, 1897	per gallon	.10
From November 1, 1897, to April 30, 1898	do	.14
Oleomargarine	per pound	.12½

Groceries:		
Codfish	per pound	$0.0345
Barley	do	.0223
Mustard	do	.24
Graham flour	per barrel	2.55
Cheese	per pound	.0898
Hominy	do	.095
Cracked wheat	do	.04½
Farina	do	.05½
Smoked pork, shoulders	do	.0635
Quaker oats	do	.04½
Canned tomatoes	per dozen cans	1.78
Canned corn	do	.55
Corn meal	per pound	.039
Sauerkraut	per barrel	5.23
Sauerkraut	per gallon	.14
Lemons	per dozen	.18
Evaporated peaches	per pound	.0648
Canned lima beans	per dozen cans	.64
Royal baking powder	per pound	.37
Pearline	per case	3.55
Dried lima beans	per pound	.0249
Hams	do	.0984
Mess pork	per barrel	8.95
Tapioca	per pound	.04½
Canned peaches	per dozen	1.00
Flavoring extract, lemon	do	.73
Flavoring extract, vanilla	do	.73
Navy beans	per pound	.01½
Table salt	do	.035
Buckwheat	do	.03½
Currants	do	.05½
Macaroni	do	.04½
Raisins	do	.05½
Rice	do	.04½
Bacon	do	.07½
Lard	do	.06
Smith's noodles	do	.08½
Sal soda	do	.85
Mackerel	per barrel	9.50
Evaporated pears	per pound	05½
Sapolio	per dozen	.74½
Oyster crackers	per pound	.04½
Evaporated apples	do	.05
Green coffee	do	.12½
"A" sugar	do	.0481
"C" sugar	do	.0412
Oatmeal	do	.02½
Granulated sugar	do	.0493
Corn starch	do	.03½
Powdered sugar	do	.05½
Candles	do	.06½
Soap	do	.03
Sirup	per gallon	.15
New Orleans molasses	do	.19
Roasted Rio coffee	per pound	.1324
Green tea	do	.24
Black tea	do	.30
Cucumber pickles	per barrel	5.75
Do	per gallon	.15
Soda crackers	per pound	.04
Evaporated prunes	do	.05
Evaporated apricots	do	.07
Canned string beans	per dozen cans	.50
Canned peas	do	.67
Vinegar	per gallon	.07½
Black pepper, whole berry	per pound	.07
Red pepper	do	.12½
White pepper	do	.10½
Clothing:		
Black felt hats	each	.57½
Dark-blue coats	do	3.44
Dark-blue vests	do	1.14
Flannel shirts	do	.72½
Canton flannel drawers	per pair	.24½
Harvard ties	do	1.02½
Woolen stockings	per dozen pairs	1.48
Pillowcases	each	.10
Bedspreads	do	1.80
Cotton sheets	do	.34
Roller towels	do	.55
Hand towels	do	1.85
Sky-blue trousers	per dozen	2.08
Woolen blankets	per pair	3.05
Beef, etc.:	each	
Fresh beef	per pound	.0575
Corned beef	do	.0262
Fresh mutton	do	.0598
Veal	do	.0650

Hot-water heating:
Furnish and install a hot-water heating apparatus for four sets of officers' quarters... $3,693.00
Electric-lighting plant:
To furnish and install an electric-lighting plant 9,154.00

E. F. LADD,
First Lieutenant, Ninth United States Cavalry, Secretary and Treasurer.

G.—*Amount expended on officers' quarters and permanent buildings from October 1, 1896, to September 30, 1897.*

House No. 1, quarters of the governor	$39.82
House No. 2, quarters of the deputy governor	82.05
House No. 3, quarters of the treasurer	150.29
House No. 4, quarters of the surgeon	159.29
Total	431.45
On account of repairs and construction of permanent buildings:	
New marble hall: Services of architect and inspector in connection with construction, heating and ventilating apparatus, purchase of scenery, etc	19,098.80
Barnes hospital: Repairs to elevators, paints and oils, repairs to ranges, repairs to roofs damaged by the storm, painting outside, glass and painting third floor inside, asphalt pavement, etc	2,253.48
Home greenhouse: Lime for repairs, purchase of glass, sashes, boiler for increasing heating capacity, plumbing for increasing water supply, and lumber for repairs	549.45
Amusement room: Repairs to pool, billiard, and bagatelle tables	78.55
Home buildings: Paints and oils for general use, repairs to sewerage, slate roofs, elevators in Home kitchen and dining room, etc	867.77
King Building, repairs to roofs damaged by storm	88.39
Anderson Building, repairs to roofs damaged by storm	49.93
Scott Building, plumbing and repairs to roofs damaged by storm	233.39
Sheridan Building, repairs to roofs, purchase of window glass	81.33
Sherman Building, repairs to roofs damaged by storm	169.17
Pump house, repairs to pumping apparatus	100.52
Boiler house, repairs to steam apparatus and increasing water supply	966.55
Home bakery, repairs to oven	3.12
Farm stables, increasing water supply for stock	38.13
Fan house, repairs to governors and boiler	40.00
Roads and grounds, gravel for repairs, repairs to bridges, sewerage, purchase of road sprinkler, etc	1,475.93
Home fire department, purchase and repairs to couplings for hose	2.60
Water tower, painting water tank	45.00
New well, purchase of brick, pump, and cost of digging, for engineer of pump house	82.50
Electric plant, partial payments made, now under construction	6,946.21
Band stand, construction of, for musicians during open-air concerts	200.29
Total	33,802.02

E. F. LADD,
First Lieutenant, Ninth United States Cavalry, Secretary and Treasurer.

H.—*Garden account from October 1, 1896, to September 30, 1897, consolidated.*

DR.

To labor, fertilizers, seeds, tools, fuel, and implements	$5,354.32

CR.

By 300 cords of wood	450.00
By 29,942 plants, trees, and shrubs raised in garden and greenhouse	1,961.95
By balance to debit of garden expended in improvement of grounds	2,942.37
	5,354.32

NOTE.—This department has the care of the ornamentation of the grounds, lawns, flowers, shrubs, trees, and fruit.

E. F. LADD,
First Lieutenant, Ninth Cavalry, Secretary and Treasurer.

I.—*Farm account from October 1, 1896, to September 30, 1897, consolidated.*

DR.

Labor, forage, fuel, fertilizers, implements, seeds, and repairs	$4,860.43
Balance to credit of farm	635.89
Total	5,496.32

CR.

111 bushels beets	62.00
14,236 heads cabbage	300.86
28 barrels cabbage	16.56
67½ bushels carrots	33.05
1,486½ dozen ears corn	148.65
86½ bushels cucumbers	31.40
960 pounds horse radish	28.80
140½ bushels kale	$33.72
5,224 heads lettuce	156.72
6,924 bunches onions	69.37
5,595 bunches parsley	141.68
1,195½ bushels potatoes	774.85
20½ bushels radishes	18.48
3,940 bunches rhubarb	93.35
74 bushels salsify	47.37
303 bushels spinach	68.40
2,874 pounds squash	21.56
96½ bushels string beans	54.35
679½ bushels tomatoes	311.97
415½ bushels turnips	83.18
300 tons of hay	3,000.00
Total	5,496.32

Estimate of vegetables in the ground on the farm September 30, 1897.

100 bushels beets, at 40 cents	$40.00	75 bushels spinach, at 20 cents	$15.00
10,000 heads cabbage, at 2 cents	200.00	50 bushels turnips, at 20 cents	10.00
100 bushels carrots, at 50 cents	50.00	150 bushels salsify, at 50 cents	75.00
6,000 bunches parsley, at 2 cents	120.00		
250 bushels parsnips, at 50 cents	125.00	Total	665.00
1,000 pounds horse radish, at 3 cents	30.00		

E. F. LADD,
First Lieutenant, Ninth Cavalry, Secretary and Treasurer.

K.—*Vegetables furnished Home and hospital mess from farm for the year ending September 30, 1897.*

Home mess	$1,892.94
Barnes Hospital	275.71
Total	2,168.65

No fruit furnished. Average number of men in Home and hospital during same period, 724.

E. F. LADD,
First Lieutenant, Ninth United States Cavalry, Secretary and Treasurer.

L.—*Vegetables purchased in addition to those received from the farm for the year ending September 30, 1897.*

Date of purchase.	Grapes.	Onions.	Squash.	Turnips.	Sweet potatoes.	Apples.	Cabbage.	Beets.	Celery.	Cranberries.	Potatoes, white.
1896.	*Baskets.*	*Bush.*	*Bbls.*	*Bbls.*	*Bbls.*	*Bbls.*	*Heads.*	*Bush.*	*Stalks.*	*Boxes.*	*Bush.*
October	406	44	13	4	21	28	16	2			
November	190	47	13		20	50			235	4½	
December		56	9		12	21	300		235	4½	138¾
1897.											
January											
February		44			3	10	630				297½
March						10					190
April						7					250
May											206¾
June											240
July											310
August		25	3								101½
September		10									
Total	596	226	38	4	56	126	946	2	470	9	1,734½
Cost	$52.20	$173.65	$48.25	$6.50	$74.75	$209.50	$61.60	$1.50	$17.23	$18.00	$814.47

Date of purchase.	Parsnips.	Oranges.	Spinach.	Onions.	Squash.	Cabbage.	Parsnips.	Sweet potatoes.	Kale.	Strawberries.
1896.	*Bbls.*	*Boxes.*	*Bbls.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Pounds.*	*Bush.*	*Quarts.*
October										
November										
December	4	2								
1897.										
January										
February	8		4							
March				1,853	713	2,561	481	207	5	
April				1,633		2,260	1,036	120		
May				1,442		972		166	40	360
June				1,369		1,900				352
July				1,070		2,100				432
August										
September						1,100				
Total	12	2	4	7,367	713	10,893	1,517	493	45	1,144
Cost	$22.00	$7.00	$4.00	$223.31	$14.26	$177.46	14	$8.22	$11.00	$93.10

L.—*Vegetables purchased in addition to those received from the farm for the year ending September 30, 1897*—Continued.

Date of purchase.	Green peas.	Blackberries.	Raspberries.	Squash.	String beans.	Potatoes, white.	Watermelons.	Cantaloupes.	Peaches.	Total.
1896.	*Bbls.*	*Quarts.*	*Quarts.*	*Bush.*	*Bbls.*	*Bbls.*	*Number.*	*Number.*	*Boxes.*	
October										$172.85
November										182.93
December										196.86
1897.										
January										
February										249.17
March										222.59
April										228.41
May										190.22
June										208.09
July										236.28
August	10	788	32	12	4	5				205.84
September							320	1,258	12	84.96
Total	10	788	32	12	4	5	320	1,258	12	
Cost	$8.50	$39.40	$3.20	$3.60	$4.00	$12.00	$28.00	$29.26	$12.00	2,178.20

E. F. LADD,
First Lieutenant Ninth United States Cavalry, Secretary and Treasurer.

M.[1]—*Home mess bill of fare for the week ending November 14, 1897.*

Monday, November 8.—Breakfast: Ham, potatoes, bread, butter, and coffee. Dinner: Soup, boiled beef, turnips, roasted sweet potatoes, pickles, grapes, bread, milk, and coffee. Supper: Roast potatoes, bread, butter, sirup, and tea. Milk consumed (56 gallons): For coffee, 11; tea, 6; kitchen, 1; and mess hall, 38 gallons.

Tuesday, November 9.—Breakfast: Beef stew, bread, butter, and coffee. Dinner: Roast beef, potatoes browned in gravy, parsnips, beets, bread, milk, and coffee. Supper: Bologna sausage, bread, butter, sirup, and tea. Milk consumed (56 gallons): For coffee, 11; tea, 6; kitchen, 11; and mess hall, 28 gallons.

Wednesday, November 10.—Breakfast: Corned-beef hash, bread, butter, and coffee. Dinner: Soup, corned beef, mashed potatoes, browned, spinach, pickles, bread, apples, milk, and coffee. Supper: Roast sweet potatoes, bread, butter, sirup, and tea. Milk consumed (56 gallons): For coffee, 11; tea, 6; kitchen, 21; and mess hall, 18 gallons.

Thursday, November 11.—Breakfast: Fresh pork sausage, hominy, bread, butter, and coffee. Dinner: Baked beans covered with sliced mess pork, beets, bread, milk, and coffee. Supper: Bread pudding, bread, butter, sirup, and tea. Milk consumed (56 gallons): For coffee, 11; tea, 6; kitchen, 17; and mess hall, 22 gallons.

Friday, November 12.—Breakfast: Codfish hash, bread, butter, and coffee. Dinner: Baked fresh fish, cold sliced meat, potatoes (mashed and browned), salsify, beets, bread, milk, and coffee. Supper: Bread, cheese, butter, sirup, and tea. Milk consumed (56 gallons): For coffee, 11; tea, 6; kitchen, 1; bakery, 10, and mess hall, 28 gallons.

Saturday, November 13.—Breakfast: Beef stew, bread, butter, and coffee. Dinner: Corned beef, cabbage, boiled peeled potatoes, pickles, bread, milk, and coffee. Supper: Roast sweet potatoes, bread, butter, sirup, and tea. Milk consumed (56 gallons): For coffee, 11; tea, 6; kitchen, 11; and mess hall, 28 gallons.

Sunday, November 14.—Breakfast: Corned-beef hash, bread, butter, and coffee. Dinner: Roast beef, potatoes browned in gravy, squash, beets, rice pudding, apples, bread, milk, and coffee. Supper: Vanilla cake, bread, butter, sirup, and tea. Milk consumed (56 gallons): For coffee, 11; tea, 6; kitchen, 5; and mess hall, 34 gallons.

R. F. BERNARD,
Brevet Brigadier-General, U. S. A., Deputy Governor.

M[2].—*Subsistence stores consumed in the month of December, 1896.*

Articles.	Pounds.	Articles.	Pounds.	Articles.	Pounds.
Sugar	3,400	Oysters (150 gallons)	1,800	Pepper, white	6
Coffee	1,316	Fresh bread	15,104	Pickles	378
Tea	135	Milk (1,860 gallons)	22,320	Oyster crackers	30
Butter	1,710	Codfish (boneless brick)	320	Hominy	100
Bacon	500	Fresh eggs (125 dozen)	125	Cheese	100
Beans	300	Squash	900	Flour	196
Rice	200	Potatoes	16,860	Sugar, granulated	60
Mustard	40	Onions	4,185	Turkey	1,125
Pepper	30	Cabbage	4,944	Prunes	100
Salt	450	Sweet potatoes	1,320	Lemon extract	2
Vinegar	378	Parsnips	550	Mace, ground	1
Ham	1,200	Salsify	1,440	Cinnamon, ground	1
Pork shoulders (smoked)	1,600	Turnips	2,255	Thyme	1
Fresh beef	7,376	Parsley	11	Green peas, in cans	240
Corned beef	4,000	Horse-radish	180	Mince pies	165
Fresh mutton	357	Cranberries	150	Total	105,465
Fresh pork	1,800	Celery	44		
Fresh pork sausage	1,750	Carrots	200	Pounds per diem	3,402$\frac{3}{31}$
Bologna sausage	250	Apples, cooking	1,350	Average daily number of men present in quarters	631$\frac{1}{2}$
Head cheese	380	Apples, eating	1,200		
Fresh fish	330	Peaches, evaporated	100		
		Pears, evaporated	100		

R. F. BERNARD,
Brevet Brigadier-General, Deputy Governor.

M[3].—*Subsistence stores consumed in the month of June, 1897.*

Articles.	Pounds.	Articles.	Pounds.	Articles.	Pounds.
Sugar	4,000	Tripe	120	Pears, evaporated	100
Coffee	1,234	Macaroni	100	Pickles	378
Tea	135	Pearl barley	100	Oyster crackers	30
Butter	1,740	Lard	20	Cheese	400
Bacon	300	Green corn (in cans)	76	Flour	392
Beans	300	Green peas (in cans)	80	Hominy	100
Rice	100	Lima beans (in cans)	80	Fresh bread	14,149
Mustard	24	Corn starch	80	Milk (1,815 gallons)	21,780
Pepper	40	Sage, ground	1	Baking powder (Royal)	12
Salt	225	Tomatoes (in cans)	60	Fresh eggs	1,350
Vinegar	378	Potatoes	12,420	Prunes	100
Ham	1,275	Onions	650	Lemon extract	2
Pork shoulders (smoked)	1,600	Onions, green	635	Mace, ground	1
Fresh beef	8,479	Cabbage	2,700	Cinnamon, ground	1
Corned beef	3,000	Lettuce	1,438	Total	88,183
Fresh mutton	950	Rhubarb	570		
Fresh fish	700	Parsley	24		
Clams (80 gallons)	960	Radishes	180	Pounds per diem	2,939$\frac{13}{30}$
Pigs feet	640	String beans	245	Average daily number of men present in quarters	619
Chicken	350	Beets	800		
Noodles, Smith's	25	Strawberries	1,704		
Mackerel	750	Peaches, evaporated	100		

R. F. BERNARD,
Brevet Brigadier-General Deputy Governor.

N[1].—*Clothing washed during month of September, 1897.*

[Cotton & Conrad, contractors.]

Date.	Sheets.	Pillow cases.	Shirts.	Drawers.	Socks.
1897.					
September 4	635	635	367	294	52
September 11	625	623	370	297	43
September 18	603	602	365	279	49
September 25	607	608	344	290	57
Total	2,470	2,468	1,446	1,160	201

R. F. BERNARD,
Brevet Brigadier-General, Deputy Governor.

N².—*Extra washing done during month of September, 1897.*

446 roller towels, at 65 cents per 100	$2.90
337 hand towels, at 30 cents per 100	1.01
94 aprons, at 1 cent	.94
87 jackets, at 5 cents	4.35
10 caps, at 3 cents	.30
5 spreads, at 3 cents	.15
58 mattress covers, at 4 cents	2.32
4 blankets, at 4 cents	.16
Total	12.13

R. F. BERNARD,
Brevet Brigadier-General, Deputy Governor.

O.—*List of crockery in daily use during the year ending September 30, 1897, with per cent of breakage.*

	Bowls.	Dinner plates.	Soup plates.	Butter dishes.	Total.
In use	900	800	750	120	2,570
Per cent of breakage	17.44	10.37	11	17.7	12.84

R. F. BERNARD,
Brevet Brigadier-General, Deputy Governor.

P.—*Number of horses and mules owned and employed September 30, 1897.*

Horses:	
For carts and wagons on roads, grounds, and police, including 1 stone-boat for policing grounds	5
Laundry wagon	2
Market wagon	2
Hospital ambulance	2
Mail wagon	1
Road sprinkler	2
Dairy	1
Farm	2
Total	17
Mules for use of home farm	4

TRANSPORTATION.

	Governor.	Deputy governor.	Treasurer.	Clinical assistant.
Forage for horses	3	1		1
Buggy and single harness			1	

E. F. LADD,
First Lieutenant, Ninth United States Cavalry, Secretary and Treasurer.

Q.—*Special diet for the week ending September 25, 1897, asked for by the patients or prescribed by the doctor.*

Ward and name of patient.	Breakfast.	Dinner.	Supper.
Ward A:			
Mackin	Oatmeal gruel, 1 soft-boiled egg.	Oatmeal porridge, milk.	Oatmeal porridge.
Brown		Milk	Milk.
Lawrence			2 soft-boiled eggs.
Harrison		Milk	Milk, 2 fried eggs.
Ward B:			
Butts		do	Milk.
Lewis	2 fried eggs, broiled mackerel.	Milk, chicken broth	Beefsteak, broiled mackerel.
Schmalzinger	Cornstarch	Coffee	Cornstarch.
Rubin	Milk toast, 2 soft-boiled eggs.	Milk toast	Milk toast, 2 soft-boiled eggs.
Lehane		Milk	2 soft-boiled eggs.
Fanerty	Hot milk, 2 soft-boiled eggs.	Hot milk, milk toast	Hot milk, oatmeal porridge.
Sheeran	2 fried eggs	Cornstarch	Beefsteak, oatmeal porridge.
Jensen	Milk toast	do	2 fried eggs.
Muir	2 fried eggs		Do.
Ward D:			
Connell	Hot milk, oatmeal porridge.	Hot milk, oatmeal porridge.	Hot milk, oatmeal porridge.
Kinsella	Oatmeal porridge	Oatmeal porridge	2 soft-boiled eggs, oatmeal porridge.
Clark		Chicken stew	
Slaughter	Milk	Milk soup	Milk, farina.
Gillespie	Beefsteak, pancakes, and maple sirup.	Chicken stew	Pancakes, maple sirup.
Wineberger	2 fried eggs		Beefsteak, milk.
Ward C:			
Leihr	Pancakes	Milk	Milk, 2 fried eggs.
Johnson		Coffee	
Travers	2 soft-boiled eggs	Milk	Milk.
Bowker	Hot milk	Hot milk	Hot milk, chicken broth.
Hauson	Milk	Milk	Milk.
Lee	Milk, 2 soft-boiled eggs.	do	Do.
Ward E:			
Laws		do	Do.
Tehany			Oatmeal porridge.
Finn	Oatmeal porridge		Do.
Ward F:			
Thope	2 soft-boiled eggs, oatmeal porridge.		2 soft-boiled eggs, oatmeal porridge.
Bentson		Milk	Milk.
Devine	Oatmeal porridge, cornstarch.	Oatmeal porridge, cornstarch.	Oatmeal porridge, cornstarch.
Godwin	2 soft-boiled eggs		Beefsteak.
Elder		Milk	Milk, oatmeal porridge.

On hand in kitchen, dining room, and wards from September 19 to 25, 1897.

On hand September 19:

Kitchen—		
Beef, fresh	pounds	110
Hams	do	69
Pease, green	cans	36
Quaker oats	pounds	6
Eggs	dozens	9
Lemons	number	4
Pearline	papers	2
Sapolio	cake	1
Soap	pounds	2
Milk consumed	gallons	14
6 gallons coffee (4 gallons kitchen, 4 gallons dining room).		
Dining room—		
Bread	pounds	60
Cake	do	24
Cheese	do	12
Butter	do	20
Pearline	paper	1
Sapolio	cake	1
Wards, etc.—		
Beer, Pabst	bottles	2
Lemons	number	6
Soap	pounds	3
Sapolio	cake	1

On hand September 20:

Kitchen—		
Beef, fresh	pounds	121
Turnips	bushel	1
Beets	do	½
Tomatoes	can	1
Ground cocoanut	paper	1
Sapolio	cake	1
Pearline	paper	1
Milk consumed	gallons	15
Coffee and tea, 4 gallons (kitchen 4½ gallons, dining room 6½ gallons).		
Dining room—		
Bread	pounds	60
Soap	cakes	2
Wards, etc.—		
Blacking, shoe	box	1
Blacking, shoe brushes	number	1
Sandpaper	sheets	10
Lemons	number	6
Beer, Pabst	bottles	2

On hand September 21:

Kitchen—		
Corned beef	pounds	100
Squashes	do	51
Quaker oats	do	6

On hand in kitchen, dining room, and wards from September 19 to 25, 1897—Continued.

On hand September 21—Continued.		
Kitchen—Continued.		
Macaroni	pounds	6
Cheese	do	2
Salt	do	10
Eggs	dozens	9
Soap	cakes	4
Pearline	paper	1
Sugar	pounds	200
Coffee	do	100
Tea	do	10
Rice	do	25
Flour	do	50
Milk consumed	gallons	15
6 gallons coffee and tea (kitchen 1 gallons, dining room 5 gallons).		
Dining room—		
Bread	pounds	70
Butter	do	20
Soap	do	2
Wards, etc.—		
Sandpaper	sheets	6
Matches	boxes	12
Granulated sugar	pounds	2
Sapolio	cake	1
Soap	pounds	2
Beer, Pabst	bottles	2
On hand September 22:		
Kitchen—		
Mutton	pounds	85
Beef, fresh	do	127
Potatoes	barrel	1
String beans	bushels	1½
Eggs	dozens	5
Tomatoes	can	1
Beets	bushel	½
Milk consumed	gallons	14
Coffee and tea, 4 gallons (kitchen 4, dining room 6 gallons).		
Dining room—		
Bread	pounds	80
Soap	do	2
Wards, etc.—		
Matches	boxes	12
Lye	cans	2
Beef extract	bottle	1
Pearline	papers	2
Soap	pounds	4
Beer, Pabst	bottles	2
On hand September 23:		
Kitchen—		
Pork, fresh	pounds	60
Sausage meat	do	42
Sausages, Frankfurter	do	15
Oats, Quaker	do	4
Matches	boxes	4
Peaches	can	1
Eggs	dozens	4
Pearline	paper	1
Milk consumed	gallons	14
6 gallons coffee and tea (kitchen 4, dining room 4 gallons).		
Dining room—		
Bread	pounds	70
On hand September 23—Continued.		
Dining room—Continued.		
Butter	pounds	20
Soap	do	2
Wards, etc.—		
Beef extract	bottles	2
Pearline	papers	2
Putz pomade	box	1
Granulated sugar	pound	1
Lemons	number	3
Matches	boxes	12
Beer, Pabst	bottle	1
On hand September 24:		
Kitchen—		
Fish, fresh	pounds	75
Sausages, bologna	do	15
Potatoes	barrel	1
Farina	pounds	6
Chicken	do	12
Vanilla, extract	bottle	1
Lemons	number	3
Pearline	paper	1
Soap	pounds	3
Eggs	dozens	5
Milk consumed	gallons	13
6 gallons coffee and tea (kitchen 3, dining room 4 gallons).		
Dining room—		
Bread	pounds	80
Mustard	do	6
Enameline	box	1
Sapolio	cake	1
Pearline	paper	1
Wards, etc.—		
Sapolio	cake	1
Lye	boxes	2
Matches	do	12
Blacking, shoe	do	1
Lemons	number	2
Beer, Pabst	bottle	1
On hand September 25:		
Kitchen—		
Beef, fresh	pounds	109
Cabbages	heads	4
Tomatoes	cans	7
Butter	pounds	10
Lard	do	10
Eggs	dozen	9
Soap	pounds	2
Corn	can	1
Milk consumed	gallons	13¾
4 gallons coffee and tea (kitchen 4, dining room 5¾ gallons).		
Dining room—		
Bread	pounds	70
Crackers, soda	do	25
Soap	do	2
Salt	do	10
Pearline	paper	1
Sapolio	cake	1
Wards, etc.—		
Lemons	number	5
Lye	can	1
Beer, Pabst	bottle	1
Vichy	siphon	1

Received, issued, and remaining on hand from September 20 to September 30, 1897.

Received and issued:		
Bacon	pounds	20
Beef, fresh	do	785
Beef, corn	do	215
Beans, string	bushels	1½
Bread	pounds	850
Butter	do	100
Cake	do	24
Cheese	do	24
Chicken	do	20½
Coffee	do	100
Cabbages	do	127
Eggs	dozen	90
Fish, fresh	pounds	75
Flour	do	50
Lemons, fresh	dozen	3
Milk	gallons	145
Matches, safety	boxes	72
Mutton	pounds	143
Pork, fresh	do	60
Potatoes	bushels	20
Rice	pounds	25
Sausage meat	do	42
Sausages, assorted	do	66
Salt	do	50
Sirup, maple	bottles	1
Received and issued—Continued.		
Sugar	pounds	200
Sugar (granulated)	do	25
Soap	do	60
Squashes	do	100
Tea	do	10
On hand October 1, 1897:		
Bread	pounds	40
Butter	do	22
Cheese	do	9
Chicken	do	2
Coffee	do	15
Eggs	dozen	13
Flour	pounds	10
Lemons	dozen	½
Matches	boxes	60
Milk	gallons	¾
Potatoes	bushels	9
Rice	pounds	20
Sausages, assorted	do	18
Salt	do	30
Sirup, maple	bottles	½
Sugar	pounds	30
Sugar (granulated)	do	25
Soap	do	40

Estimate for stores and supplies for use of Barnes Hospital during September, 1897.

Apricots, evaporated	pounds	50
Apples, evaporated	do	50
Baking powder, Royal	do	6
Beer, Pabst	dozen	6
Brushes, blacking		3
Beans, Lima	cans	12
Beans, Lima, dried	pounds	50
Codfish, salt	do	75
Cheese	do	80
Chicken	do	100
Crackers, soda	do	50
Crackers, oysters	do	10
Cocoanut, ground	do	1
Eggs	dozen	300
Farina	pounds	24
Fish, fresh	do	150
Hams	do	300
Lard	do	30
Extract beef, liquid, Armour's	dozen	1
Lemons, fresh	do	10
Lemon, extract	do	1
Lye, R. S	do	2
Macaroni	pounds	24
Matches, Underwriters' safety	gross	1½
Noodles, Smith's	pounds	25
Nutmegs, ground	pounds	1
Quaker oats, 2-pound packages		25
Onions	bushels	8
Oysters	gallons	18
Peaches	cans	12
Peaches, dried	pounds	50
Prunes, California	do	50
Peas, 1-pound cans	dozen	10
Pork, fresh	pounds	300
Peas, green, dried	do	75
Pearline	cases	1
Raisins	pounds	10
Currants	do	10
Sausage meat, sausages assorted	do	180
Sapolio	dozen	4
Sugar, granulated	pounds	75
Sugar, powdered	do	10
Sardines	boxes	6
Shoulders, sugar-cured	pounds	150
Tomatoes, 3-pound cans	dozen	2
Vanilla, extract	do	1
Vichy	do	2
Brandy, French	gallons	1
Whisky, Upper Ten	do	5

Full diet for the week ending September 25, 1897.

Sunday.—Breakfast: Boiled ham, baked potatoes, butter, bread, coffee. Dinner: Roast beef, gravy, green peas, mashed potatoes, bread pudding, butter, bread, coffee. Supper: Cake, cheese and crackers, butter, bread, coffee.

Monday.—Breakfast: Irish stew, butter, bread, coffee. Dinner: Pea soup, boiled beef, gravy, mashed turnips, potatoes, butter, bread. Supper: Cold meat, stewed peaches, butter, bread, tea.

Tuesday.—Breakfast: Baked meat hash, butter, bread, coffee. Dinner: Fresh corned beef, baked squash, potatoes, beets, butter, bread, coffee. Supper: Macaroni and cheese, green corn, butter, bread, tea.

Wednesday.—Breakfast: Mutton pie, butter, bread, coffee. Dinner: Vegetable soup, roast beef, gravy, potatoes, string beans, butter, bread. Supper: Cold corned beef, potato salad, butter, bread, tea.

Thursday.—Breakfast: Fried sausage meat, potatoes, butter, bread, coffee. Dinner: Roast fresh pork. Boston baked beans, pickled beets, butter, bread, coffee. Supper: Frankfurters, sliced tomatoes, butter, bread, tea.

Friday.—Breakfast: Fried bacon, soft-boiled eggs, butter, bread, coffee. Dinner: Fresh fish, lemon sauce, mashed potatoes, farina pudding, butter, bread, coffee. Supper: Bologna, fried potatoes, butter, bread, tea.

Saturday.—Breakfast: Wet meat hash, butter, bread, coffee. Dinner: Beef soup, boiled beef, gravy, potatoes, stewed tomatoes, butter, bread. Supper: Cold meat, stewed prunes, butter, bread, tea.

HOSPITAL MESS.

Ration return for ten days, from the 21st to the 30th of September, 1897.

Required:		
Sugar	pounds	200
Coffee	do	100
Tea	do	10
Bacon	do	20
Rice	do	25
Flour	do	50
Soap	do	60
Salt	do	50
Butter	do	100
Clinical assistant		1
Hospital matron		1
Attached		1
Employees		30
Patients		82
Total		115

R.—*List of medicines on hand March 31, 1897, and six months' supply received April 3, 1897, at hospital.*

Aggregate number present (all invalids)	722
Average in hospital	75.91
Average at sick call	6.28

Articles.	On hand.	Received.
Acacia:		
Gum, pounds		1
Powdered, do	8	
Acetanilid, do	2	
Acid:		
Acetic, do	2	
Benzoic, ounces	3	
Boracic, pounds	10	
Carbolic, pure, do	½	
Carbolic, common, do	20	
Citric, do	1	
Hydrochloric, C. P, do	1	1
Nitric, C. P, do	1	1
Nitric, commercial, do	4	
Oxalic, do	10	
Salicylic, do	1	
Sulphuric, C. P, do	1	
Sulphuric, commercial, do		5
Tartaric, do		3
Tannic, do	1	
Alcohol, gallons	5	12
Ammonia:		
Aromatic spirits, pounds	1	
Bromide, do	1	
Salicylate, do	1	
Water of, do		15
Antikamnia, ounces	5	3
Antipyrine, do	7	
Bark, wild cherry, powdered, pounds	10	
Bismuth, subnitrate, pounds		5
Bismuth, subcarbonate, do		2
Bromine, ounces	6	
Camphor, gum, pounds	3	
Capsules, boxes	20	
Cardamom seed, powdered, pounds	2	
Catechu, pounds	2	
Campho-phenique, bottles	4	6
Chloranodyne, ounces	9	
Chloralamid, do	2	
Chloroform, pounds	3	3
Chloral hydrate, ounces	8	
Cocaine, hydrochlorate, do		1
Collodion, flexible, do	5	6
Creosote, beechwood, pounds	2	2
Copaiba, balsam, do		5
Elixir purgans, bottles	16	
Ether:		
Fortior, pounds	5	8
Commercial, do		4
Spirits, compound, do		2
Spirits, nitrous, do		5
Extract:		
Belladonna, ounces	1	
Buchu, fluid, do	8	
Cascara sagrada, fluid, ounces		3
Triticum repens, fluid, pounds		3
Licorice, pounds	5	
Nux vomica, ounces	4	
Opium, aqua, do	1	
Uva ursi, fluid, pounds	1	3
Flaxseed, do	15	
Flaxseed meal, do	15	25
Formalin, do	2	4
Glycerin, do	2	10
Glycyrrhiza, compound powder, pounds		3
Hydrozone, pounds	10	24
Iodine, ounces	1	4
Iodoform, pounds	3	10
Ipecac and opium, powdered, do	2	
Iron:		
Citrate, and quinia, ounces	3	
Dialysed, pounds		1
Pyrophosphate, do	1	1
Reduced, ounces	2	
Sirup, iodide of, pounds	1	
Lanolin, do	2	
Lead, acetate, do	2	
Listerine, bottles	3	2
Lycopodium, ounces	6	
Magnesia:		
Carbonate, pounds	1	
Sulphate, do	15	
Mercury:		
Bichloride, do	1	1
Mild chloride, do	1	
Metallic, do	1	
Ointment, nitrate, do	1	
Oleate, do	1	
Morphia:		
Acetate, ounces	½	
Sulphate, do		1

R.—*List of medicines on hand March 31, 1897, and six months' supply received April 3, 1897, at hospital*—Continued.

Articles.	On hand.	Received.	Articles.	On hand.	Received.
Oil:			Plaster—Continued.		
Cassia.....ounces..	4	.....	Porous.....number..	300	.....
Cloves.....do....	1	.....	Quinia, sulphate.....ounces..	12	12
Croton.....do....	2	.....	Rhubarb:		
Lemon.....do....	8	.....	Powdered.....do....	32	.....
Malefern.....do....	1	.....	Root.....do.....	.....	16
Orange.....do....	8	.....	Rochelle salts.....pounds..	10	10
Rosemary.....do....	6	.....	Silver, nitrate.....ounces..	1	.....
Spearmint.....do....	8	.....	Silver, nitrate, fused.....do....	1	.....
Castor.....gallons...	.....	3	Soap, castile.....bars..	.....	6
Codliver.....do....	2	5	Soda:		
Cotton seed.....do....	1	5	Bicarbonate.....pounds..	5	5
Turpentine.....do....	.....	60	Borate.....do....	.....	5
Opium, powder.....pounds..	.....	1	Chlorinated sol.....bottles..	10	.....
Paraffin.....do....	.....	1	Salicylate.....pounds..	3	3
Pepsin.....ounces..	.....	4	Stramonium leaves.....do....	.....	4
Peru, balsam.....pounds..	.....	3	Sulfonal.....ounces..	2	6
Petrolatum.....do....	20	.....	Sulphur:		
Phenacetin.....ounces..	5	5	Washed.....pounds..	2	.....
Pills:			Roll.....do....	20	.....
Anticonstipation..number..	7,000	.....	Tablets:		
Cathartic, compound..do....	.....	1,000	Antiseptic, No. 3..number..	200	.....
Dover's powder.....do....	.....	500	Antiseptic, No. 4.....do....	300	.....
Mass hydrarg.....do....	1,000	.....	Calomel and sugar.....do....	1,000	.....
Quinia, sulphate, 2 grains, number.....	.....	1,000	Heart tonic.....do....	.....	500
Quinia, sulphate, 3 grains, number.....	.....	2,000	Morph. sulph., $\frac{1}{4}$ gr....do....	200	.....
Salol, 5 grains.....number..	.....	500	Morph. sulph., $\frac{1}{2}$ gr....do....	200	.....
Potassa:			Therapol.....ounces..	12	24
Acetate.....pounds..	2	.....	Tincture:		
Chlorate.....do....	3	.....	Belladonna.....do....	30	.....
Bicarbonate.....do....	1	.....	Chloride of iron.....do....	32	.....
Bichromate.....do....	2	.....	Serpentaria.....do....	28	.....
Bitartrate.....do....	2	.....	Veratrum viride.....do....	4	.....
Bromide.....do....	5	.....	Trikresol.....pounds..	3	3
Iodide.....do....	.....	10	Wax:		
Nitrate.....do....	.....	2	White.....ounces..	5	.....
Permanganate.....do....	3	.....	Yellow.....pounds..	.....	12
Plaster of paris.....do....	.....	5	Whisky.....gallons..	1	5
Plaster:			Wine, sherry.....do....	.....	1
Adhesive.....yards..	.....	24	Wine, port.....do....	1	.....
Belladonna.....do....	10	.....	Zinc:		
Mustard.....do....	9	.....	Acetate.....ounces..	8	.....
			Oxide.....do....	.....	16
			Sulphate.....do....	16	.....

S.—*Statement showing average cost per capita, general expenditures, at the National Volunteer Home and the United States Soldiers' Home, and cost of outdoor relief at the latter for the past eight years.*

Year.	National Home.			United States Soldiers' Home.					
	General expenditures.	Average present.	Average cost per capita.	General expenditures.*a*	Average present.*a*	Average cost per capita.	Average on outdoor relief.	Total cost.	Average cost per capita.
1890.....	$2,283,510.04	12,935	$176.54	$263,322.80	1,106	$238.09	420	*b*$34,288.80	$81.64
1891.....	2,434,685.34	13,931	174.77	274,185.18	1,219	224.92	502	*b*42,092.70	83.85
1892.....	2,471,937.36	14,196	174.13	196,653.43	1,115	176.37	370	31,266.48	84.50
1893.....	2,405,022.30	14,661	164.04	222,267.40	1,068	208.12	317	26,220.10	82.71
1894.....	2,296,817.87	15,601	147.22	189,941.67	1,090	174.26	316	26,404.53	83.56
1895.....	2,204,930.33	16,480	133.79	161,039.94	1,001	160.88	323	26,677.00	82.53
1896.....	2,278,976.62	17,454	130.51	209,702.64	1,007	208.24	310	26,471.06	83.09
1897.....	2,553,469.69	18,169	140.54	194,846.28	1,065	182.95	337	27,843.48	82.72
Total.	18,929,349.55	123,427	153.36	1,711,959.34	8,671	197.44	2,904	241,264.24	83.05

a Outdoor relief included.

b Approximate amount.

REPORT OF BOARD OF VISITORS TO THE UNITED STATES MILITARY ACADEMY.

REPORT

OF THE

BOARD OF VISITORS

TO THE

UNITED STATES MILITARY ACADEMY

FOR THE YEAR 1897.

To the Secretary of War, the President of the Senate, and the Speaker of the House of Representatives:

The following report of the Board of Visitors, appointed in pursuance of section 1327, Revised Statutes, to the United States Military Academy at West Point, N. Y., June 1, 1897, is respectfully presented.

The persons constituting the Board are named below:

APPOINTED BY THE PRESIDENT OF THE UNITED STATES.

1. Mr. GEORGE F. EVANS ..... Portland, Me.
2. Col. JAMES E. FLEMING ..... Newark, N. J.
3. Hon. LOUIS W. HALL ..... Harrisburg, Pa.
4. Hon. W. H. UPSON ..... Akron, Ohio.
5. Col. ALDACE F. WALKER ..... New York, N. Y.
6. Mr. WILLIAM B. PLUNKETT ..... Adams, Mass.
7. Col. WILLIAM R. SMEDBERG ..... San Francisco, Cal.

APPOINTED BY THE PRESIDENT OF THE SENATE.

8. Hon. JOSEPH B. FORAKER ..... Cincinnati, Ohio.
9. Hon. SAMUEL PASCO ..... Monticello, Fla.

APPOINTED BY THE SPEAKER OF THE HOUSE OF REPRESENTATIVES.

10. Vacant.
11. Hon. HUGH R. BELKNAP ..... Chicago, Ill.
12. Hon. JOSEPH E. WASHINGTON ..... Cedar Hill, Tenn.

All the members of the Board except Hon. Joseph B. Foraker were present, and, after a temporary organization, elected Hon. W. H. Upson president, Hon. Samuel Pasco vice-president, and Hon. Joseph E. Washington secretary.

The following committees were appointed:

Appointments and examinations.—Messrs. Pasco, Walker, and Washington.

Discipline and instruction.—Messrs. Smedberg, Hall, and Fleming.

Armament and equipment.—Messrs. Fleming, Evans, and Smedberg.

Buildings, grounds, and lights.—Messrs. Belknap, Pasco, and Plunkett.

Fiscal affairs, supplies, and expenditures for cadets.—Messrs. Walker, Evans, and Hall.

Hygiene and athletics.—Messrs. Washington, Plunkett, and Belknap

The examinations, exercises, and military drills were attended from day to day by the members of the Board. The Superintendent, the Commandant of Cadets, the professors and instructors gave to the Board all needed assistance in the performance of their duties and furnished all the information from time to time required.

The general condition of the Academy is good in every respect, and it admirably accomplishes the object for which it was established by furnishing to the Army of the United States patriotic, honorable, and thoroughly educated officers.

The Board has given to the subject of appointments and examinations careful attention and consideration and has arrived at the following conclusions:

The success of the Military Academy rests upon the appointing power. The highest and best results will be accomplished only when it is wisely and judiciously exercised.

Though this power is vested in the President, he acts upon his own judgment only in selecting the ten cadets at large and the one from the District of Columbia; those from the Congressional districts and the Territories are nominated by the Representatives and Delegates in Congress, and, under the practice that has for a long time existed, the nomination is in effect an appointment, for the President always acts favorably upon it.

The whole number of appointments is as follows:

At large	10
Congressional districts	357
Territories	3
District of Columbia	1
Total	371

The appointing power is, however, limited by certain qualifications as to age, height, health, and educational advancement, and by the express terms of the law a candidate must be unmarried. The requirements as to health and scholarship are fixed by law and under the direction of the War Department. Boards of Army officers convene early in March of each year in different parts of the country to examine the candidates who have been selected, and those who succeed in passing these examinations are admitted to the Academy in the following June.

A further opportunity to fill the vacancies that may exist in consequence of failures at the March examination, and other causes, is offered

in June, just before the time for the entering of the new class. This examination is held only at West Point. In cases of unavoidable absence at these examinations a further opportunity is given to candidates to present themselves before an examining board at the Military Academy during the last week in August. The successful candidates at these examinations are admissible to the new class, and the places of those who fail to present themselves, or who are rejected, remain vacant until the following year, except in cases where alternates of the rejected candidates have been appointed and have appeared and passed a successful examination. In these cases the successful alternates succeed to the rights and privileges of their rejected principals.

The following statement shows the result of the examinations held in March of the present year:

Accepted:		
Principals	74	
Alternates	12	
		86
Alternates qualified for whom no vacancies exist		20
Rejected as not mentally qualified:		
Principals	31	
Alternates	25	
		56
Rejected as not physically qualified:		
Principals	7	
Alternates	5	
		12
Rejected as not qualified mentally or physically:		
Principals	5	
Alternates	5	
		10
Left before completion of examination:		
Principal	1	
Alternate	1	
		2
Failed to report:		
Principals	5	
Alternates	19	
		24
Total:		
Principals	123	
Alternates	87	
		210

From this it appears that out of the 210 candidates 106 were successful, but 20 of these were alternates for whom there were no vacancies, because the principals were also successful.

A statement of the result of the examination held in March, 1896, has been furnished the Board, and it shows that 189 candidates presented themselves. Ninety-four of these were successful, but there were no places for 15 of these, because their principals were also successful.

Some other statements are here submitted which will be of assistance in determining the number of those who, in recent years, have,

after entering, failed to receive the benefit of the full course at the Academy.

Number of cadets who have been separated from the United States Military Academy from July 1, 1896, to June 1, 1897.

Resigned	6
Discharged	38
Dismissed	2
Died	0
Total	46

Number of graduates in each class for five years past.

In 1892	62
1893	51
1894	54
1895	52
1896	73
Total	292
Average	58+

Number of vacancies at the United States Military Academy at the beginning and close of the present academic year.

Number allowed by law		371
Number of cadets September 1, 1896		332
Vacancies		39
Number allowed by law		371
Number of cadets June 8, 1897:		
First class	68	
Second class	62	
Third class	71	
Fourth class	81	
		288
Vacancies		83

Thus it appears that 46 vacancies have occurred during the year ending at the beginning of the present month, from other causes than the completion of the prescribed course of study, and as there are 83 vacancies in all, the examination held for the purpose of making up the present fourth class left 37 places, which were unfilled at the beginning of the present academic year, or about 10 per cent of the authorized number of cadets.

It appears, too, that during the last five years 292 cadets have been graduated, an average of a fraction over 58 each year. But if the Academy were kept up to its maximum number of 371 there would be an average of about 92 in each graduating class instead of 58. This indicates an actual annual loss of 34 from the possible number of graduates.

These results will be useful in considering the question of opening the doors of the Academy to a larger number of candidates each year,

which has been discussed by former Boards of Visitors and by others interested in the advancement and success of the Academy. It has been suggested that there is room here for more cadets, and that so many opportunities should not be lost to the young men of the country who are capable of profiting by the advantages here offered.

If there were more appointments at large, and two from each State for the Senators to fill, it is urged that the additional cadets could be provided for without any large additional expenditures for buildings or instructors, and the increased number of graduates would fill useful places in their different States and Territories when they were not needed in the military service of the country.

But we do not find that there are accommodations in the barracks for a much larger number of cadets than can be appointed under the law as it now exists. It was reported last year that there were ample accommodations for 296 cadets, placing two in a room according to existing arrangements, and that by vacating certain rooms, used for other purposes, sufficient accommodations could be provided for 384. This is only 13 in excess of the number of cadets now authorized by law, and the history of the past admonishes us that there will be an increase of 30 or more in the whole number of appointments when an apportionment is made under the new census which will be taken in 1900.

If the present average of failures, rejections, and dismissals is to be treated as inevitable, and is to enter into our estimates as a fixed and determined quantity, it may be safe to authorize the appointment of 90 or more additional cadets, otherwise the number should not be increased without enlarging the barracks.

A considerable addition to the number of cadets would make it important and desirable to have a larger number of instructors. Under the present system of recitations the classes are divided into sections, and each cadet is called upon every day to recite, and there is no opportunity to escape the result of a failure to prepare for a recitation, as there is when divisions are large and all are not required to recite whenever the division meets.

The Board does not deem it desirable to recommend any enlargement of the purposes of the Academy beyond those now contemplated by existing law. Provision should be made for supplying the Army with a sufficient number of competent officers. This work is being satisfactorily accomplished. If arrangements are made for giving a much larger number of young men such an education as the course at the Academy affords, it will be with the expectation that many of them will be obliged to seek employment after they graduate outside of a military life, and it is not desirable to offer to a select few educational advantages merely to fit them for usefulness in private life in other professions and vocations than a public military career.

We favor, however, a more complete execution of the purpose contemplated by the law establishing and carrying on the Military Academy.

The figures already submitted show that many of those who are appointed are not qualified to enter upon the prescribed course of study and that many others who enter upon it fail to complete it. There are others who manage to get through the course, but without distinction and without developing any particular ability in the studies and accomplishments that fit one for a successful military career. This is largely due to the unwise action of the appointing power. The examinations are necessarily strict; their purpose is to ascertain whether the candidate is fitted to undertake the course of study, and the number of failures after the course has been entered upon indicates that the examiners have not been too exacting.

There would doubtless be fewer failures if the appointments were more carefully made. One of the members of this Board of Visitors has had some experience in the discharge of this duty, and the candidates he has recommended have generally been successful. He has selected a few young men from the applicants in his district by means of his personal knowledge of their character, associations, and opportunities. These have been required to go before an examining board, and the one best qualified, in the judgment of this board, has obtained the nomination and appointment.

The Board suggests that the March examinations be extended; that the papers be passed upon without delay, and that in case of failure the person who made the appointment be at once notified and authorized to make another nomination, and again a third, if practicable, before the examining board closes its labors. If there is a third failure, still another opportunity might be given at the June examination to a candidate who had not had a previous trial at any of the March examinations, and this should be final, except as at present, in cases of unavoidable absence. Greater care in selecting candidates, with these enlarged opportunities for examination, would largely reduce the number of vacancies with which the academic year usually opens.

The Board is informed that most, if not all, of those who attain a high rank in the academic course have, before their admission, made progress in other studies than those included in the statutory requirements. This is particularly the case with reference to mathematical studies. It is believed that better results would be obtained if all who enter were required to pass an examination in algebra and the elements of geometry. The free public schools all over the country teach these branches, and if they were among the requirements for admission candidates would take greater pains, during the time allowed for preparation after their appointment, to prepare for their examinations, and perhaps the results would be more satisfactory. To effect this change the Board recommends that section 1319 of the Revised Statutes be amended to read as follows:

SEC. 1319. Appointees shall be examined under regulations to be prescribed from time to time by the Secretary of War before they shall be admitted to the Academy, and shall be required to be well versed in reading, writi arithmetic, and algebra,

and to have a knowledge of the elements of geometry, of English grammar, of descriptive geography, particularly that of the United States, and of the history of the United States.

The examinations have been conducted by the academic board from day to day in the presence of the members of the Board of Visitors and others who have attended. To accomplish the work in less time and in a thorough manner the academic board were divided into two committees, who began their sessions on the 1st instant and continued them till they were completed, on Tuesday, the 8th instant. Their daily sessions were from 9 a. m. to 1 p. m. and from 2.30 p. m. to 4 p. m. The Superintendent presided at some of these examinations, and the professors and instructors belonging to the two committees were diligent and faithful in the discharge of the duties assigned to them.

The oral examinations were fairly conducted, and the members of the Board who attended them were impressed with the bearing of the cadets toward their instructors and with the admirable discipline that was everywhere manifest. So far as they could judge, the examinations appeared to be thorough, and the recitations were generally creditable and satisfactory.

In examining the course of study, we have been impressed with the importance of making a larger place in the curriculum for the study of the English language. The want of time has been urged as a reason why this important subject has not received the attention it deserves. Perhaps, if the change in the requirements for admission is made according to the recommendation contained in this report, time and space may be found for extending the brief course of study in this department, now restricted to a part of the first year's course.

An officer ought to have a thorough knowledge of his own language. It is not often important that he should be an orator, but it is important that his reports, letters, and orders be expressed in clear and terse language. The operations of armies and the exploits of individual officers and men frequently fill pages in the history of our country. It is through the official reports that the accounts of such operations and acts reach the Department and the public, and it should be a part of the education of every army officer to learn his own language thoroughly, so that this important duty may be done on the same plane of excellence that characterizes his other work. It will not be necessary to go beyond the limits of our own country to find military writers whose style may be studied with profit and advantage.

The Board suggests that, in connection with the course of history, the cadets might be required to study the military operations leading up to and resulting in a battle or a siege, and after the class has become well acquainted with the details let the members prepare reports of the part taken in these operations by each brigade, division, corps, or detached command. It is believed that a few such exercises would be valuable in the education of officers who may sometimes meet the realities of war in the service of their country.

We express the hope that the academic board will consider the subject of extending and enlarging the English course. Many cadets enter the Academy who have had little time and few opportunities to study their own language and literature, and they will be better fitted for the great duties which await them in the outside world if a judicious course of study is marked out to supply such deficiencies.

ARMAMENT AND EQUIPMENT.

We have carefully inspected the armament and equipment of the Academy. The needs and condition are clearly stated in the communication made to the Board by Capt. L. L. Bruff, instructor of ordnance and gunnery, which we will print as an appendix to this report.

We cordially concur in the recommendations made by Captain Bruff with reference to appropriations, which are as follows:

For model carriages to complete the collection	$2,500
For keeping the Museum in repair and purchasing new models and fitting up the same	300

Also the complete armament of the siege gun and siege mortar battery, the material for which can be supplied by the Ordnance Department.

DISCIPLINE AND INSTRUCTION.

We find that the methods of discipline and instruction, as followed at West Point, are the result of many years of experience of accomplished and painstaking officers and are as nearly perfect in their result as it seems possible to make them.

With the exception of such as are noted elsewhere, we have no changes to suggest and nothing but commendation for the working of all the branches of the Military Academy.

The result of Captain Parker's painstaking as instructor in cavalry tactics was evidenced in the admirable drill of the graduating class in the school of the troop and the exercises in horsemanship in the riding academy; also in the improved appearance of the detachment of United States cavalry stationed at the post.

The able, efficient, and satisfactory manner in which Col. Samuel M. Mills, commandant of cadets, has discharged the duties of that position deserves special notice and commendation.

BUILDINGS AND GROUNDS.

The barracks are in good condition and the cadets are comfortably quartered. The mess hall is well adapted to its purpose and ample space is afforded for the members of the corps of cadets. The kitchen, pantry, and other necessary appurtenances are well kept and afford all the conveniences for carrying on the work properly belonging to the establishment. The parade grounds and the immediate surroundings present an attractive appearance and give evidence of constant care

and industrious supervision. The gymnasium, riding hall, stables, and other outbuildings are in good order.

LIBRARY BUILDING.

Attention has been called in former reports to the library building and the importance of making such changes in it as to make the entire building suitable for library purposes. There are more than 40,000 books and pamphlets belonging to the library, besides many valuable pictures, maps, and manuscripts, and by the removal of the observatory and other changes the entire building can now be used for library purposes. It has been frequently recommended to Congress that the building be made fireproof and that other alterations and modifications be made, with this purpose in view. An appropriation of $1,250 was made by Congress in 1895 for procuring plans, specifications, and estimates for the complete renovation of the building. This work has been done, and the architects' estimate of the cost of the proposed changes is $63,100. The Superintendent has recommended an increase in the estimate of $6,900 for removing and returning the books and for inspection and contingencies, making a total of $70,000. We understand that the Secretary has recommended that an appropriation be made by Congress of this sum, in accordance with these estimates, but as yet Congress has taken no action.

We fully agree as to the great importance of this work. The proposed changes should be made at the earliest possible time. The danger of irreparable loss will continue as long as there is so much woodwork in the interior. The addition of more shelving and the enlargement of space for reading rooms will afford greater accommodations for those who desire to use the library. We, however, are not satisfied that so large an amount is necessary to make the proposed alterations, and we suggest that the plans, specifications, and estimates be carefully examined under the direction of the Secretary of War, so that if the desired results can be accomplished on a more economical scale the estimates may be revised before the proposition for an appropriation is again submitted to Congress.

In connection with the library building we recommend the construction of a fireproof vault for the preservation of the valuable archives and military records of the post, some of which date back sixty years or more.

HOTEL.

The hotel on the grounds is in very bad condition and requires very much repairing. In nearly every room floor boards are loose; blinds and sashes, doors and locks are out of order. We recommend that the $1,000 used annually for repairs about the hotel be appropriated the coming year to improvement of above-mentioned items and the establishment of an additional bathroom on first and second floors. We fully recognize the necessity in the near future of remodeling or rebuild-

ing the hotel, that it may be in keeping with other Government buildings on the post and containing the ordinary comforts of a modern hotel, but, owing to the sum absolutely required for the urgent and immediate improvement of the post, we suggest that further action in the matter be, for the present, postponed.

BUILDING FOR OFFICERS' MESS.

At every army post built during the past ten years the necessity has been recognized of a separate and detached building for officers' mess hall, kitchen, etc., clubroom, and bachelors' quarters, assembly room, etc.

At this post, where more officers are stationed than at any other, the most beautiful in the country, and the most visited by foreigners as well as by our own people, where more guests are necessarily entertained, no such building exists, and it appears to us that these accommodations should be provided at an early date.

Without plans and estimates no definite recommendation can be made by the Board, but we recommend that this question be considered by the Superintendent, commandant, and other military officers of the post, and the academic board, in order that the Board of Visitors of 1898 may have the necessary data before them as to style, expense, and location of building, to consider and report upon the matter understandingly.

THE WHARF.

Our attention has been called to the condition of the wharf at the south dock. We have examined it carefully. Some recent repairs have made it safe for the present, but it has been standing a long time and many of the timbers are decaying. It should be rebuilt at an early day, and this, next to the library and the expenditures in connection with the water supply, appears to be the most urgent want of the post. We are informed that a new wharf will cost $20,000, but do not know what this estimate is founded upon. We recommend, with respect to this, as to other buildings and repairs, a rigid scrutiny of all estimates, so that there may be no profuse expenditure of the public money. A sidewalk from this wharf, leading up the hill, has also been recommended, and we favor its construction. We believe it is greatly needed. Many of the visitors walk up and down the hill while carriages and other vehicles are going to and fro, and there is always danger to life and limb, particularly when little children are passing. We recommend that the walk be of concrete and that the cost do not exceed the sum of $3,000.

Other wants of the post have been called to our attention, but for the present they should give way to those that appear to be more urgent.

FISCAL AFFAIRS.

The committee of this Board to whom the duty was assigned investigated the fiscal affairs, the supplies and expenditures for the cadets.

They found nothing to condemn and reported that existing arrangements are working smoothly and the officers in charge are performing their duties satisfactorily and well.

THE BAND.

We concur in the recommendations made by previous Boards of Visitors that the band be increased to 40 pieces.

HYGIENE.

We made as thorough an examination into the sources of the supply the quantity and quality of the water as our time would permit. We were afforded every opportunity to examine the reservoirs, filters, pipes, etc., and received the greatest courtesy and kindness from Capt. James L. Lusk, the efficient officer in charge. We reached the unanimous conclusion that, with the completion of the new reservoir, the supply of water would be ample for all the needs of the post for many years to come. The water is unusually clean and free from pollution. It is gathered from the watershed formed by the high, heavily wooded mountains back of the post. The rains and snows percolating through the soil and rocks feed never-failing springs. These, in turn, supply the small streams whose flow is stored in the reservoirs. There are no streams available with a constant flow sufficient to furnish all the water required; therefore it has been found necessary to gather and store away in reservoirs a quantity of water sufficient to last for several months. The water, in percolating through the soil and earth, takes up a considerable quantity of vegetable matter, and, while standing in the reservoirs, might take up some germs. As a matter of precaution, therefore, we think it would be the part both of wisdom and economy for Congress to appropriate the amount required to finish, as quickly as possible, the filtering houses already authorized by law and now under construction.

The progress of the work, the need of further appropriation, and many other facts are so clearly set forth in a communication addressed to us by Captain Lusk that we print it as an appendix to this report.

The sanitary condition of the Academy is excellent. There is very little sickness other than an occasional case of malaria, due to no local cause so far as we could ascertain. There has been but one death in the corps of cadets for many years.

CADET HOSPITAL.

Too much can not be said of the order, system, and neatness which we found in the cadet hospital, and due credit should be given Maj. George H. Torney, surgeon in charge. No very serious surgical operation has been necessary at the Academy for a long time. Smaller operations, requiring the greatest care against infection and the highest surgical skill, are not infrequent. The construction of an operating room, where surgical work can be performed under the conditions

required by modern surgery, is, in our opinion, eminently desirable. There is no such room in the cadet hospital at present. There is also a great necessity for a suitable addition to the annex to the hospital, in which the urinals and water-closets shall be located. The existing arrangement and appliances are unsatisfactory. Proper sanitary precautions, comfort, and privacy for the sick make this necessary. The estimated cost of this addition, including new plumbing, submitted by the quartermaster is $2,200.

We examined the hospital for the enlisted men and found it in such excellent condition that we can not refrain from paying a just tribute to Capt. Charles F. Mason, assistant surgeon in charge. No improvements or alterations are asked.

ATHLETICS.

We find the condition of the gymnasium all that can be desired. It is equipped with all the modern appliances. The drill of the fourth class showed careful training and good work. We find that regular instruction is given only to the fourth class. More advanced cadets are required to attend the gymnasium and practice only for the purpose of overcoming any particular deficiency which may have been found to exist.

We cheerfully join in the recommendation hitherto made that the master of the sword and instructor in the gymnasium be given the rank, pay, and allowances of a first lieutenant.

The proper enforcement of military discipline in the gymnasium makes this exceedingly desirable, and, in the case of the present instructor, it would be a just recognition of merit, proficiency, and long and faithful service.

In conclusion, the members of the Board wish to express their appreciation of the uniform courtesy and kindness with which they have been treated in the discharge of their duties by all who are connected with the Academy.

All of which is respectfully submitted.

WM. H. UPSON,
President.
SAMUEL PASCO,
Vice-President.
JOSEPH E. WASHINGTON,
Secretary.
GEO. F. EVANS.
W. B. PLUNKETT.
HUGH R. BELKNAP.
LOUIS W. HALL.
W. R. SMEDBERG.
ALDACE F. WALKER.
JAMES E. FLEMING.

APPENDIXES.

APPENDIX A.

WEST POINT, N. Y., *June 7, 1897.*

SIR: In accordance with your request and by direction of the Superintendent of the United States Military Academy, I have the honor to submit, for the information of your committee, the following statement with reference to the present armament and equipment of the Academy:

THE BATTERIES.

These may be divided into seacoast, siege, and field batteries.

Seacoast batteries.—There are two of these, one called "the seacoast battery" and the other "Battery Knox." The seacoast battery, so called, is at the north end of the post looking north up the river. Battery Knox is on the eastern side of the post looking across the river. The seacoast battery is used for the instruction of cadets in heavy gun drill, and Battery Knox is unused except occasionally for saluting purposes.

Armament of seacoast battery.—The following guns and carriages are in place in this battery: One 8-inch steel breech-loading rifle complete, of the latest model, mounted on the barbette carriage provided for it, this carriage being also of the latest type; one 15-inch Rodman smoothbore, mounted on a front-pintle barbette carriage strengthened, with hydraulic buffer; one 12-inch steel breech-loading mortar complete, of the latest model, mounted on the service mortar carriage, also of the latest type; five 8-inch converted rifles, mounted on front-pintle barbette carriages strengthened, with hydraulic buffers. This battery has lately been remodeled, and it now contains a type of each of our service guns and carriages.

Armament of Battery Knox.—The following guns and carriages are in place in this battery: One 100-pound Parrott rifle, on old carriage; one 300-pound Parrott rifle, on old carriage; four 10-inch Rodman smoothbore guns, on old carriages; one 8-inch converted rifle, on old carriage. As this battery can not be fired owing to its location, and is never used except for saluting, no changes are needed in its armament.

The siege and mortar battery.—This battery is located at the north end of the post above the seacoast battery, looking up the river. The following guns and carriages are in the siege battery: Two 5-inch steel breech-loading siege guns, mounted on their carriages, and four 4.5-inch cast-iron rifled siege guns mounted on wooden carriages. The carriages for the two 5-inch guns are of the modern type, but can not be used at present, as they have no hydraulic buffers. These will be supplied as soon as they are completed. The 4.5-inch siege guns, with their carriages, are obsolete and are no longer used except for drill purposes. This battery will contain when complete, four 5-inch steel breech-loading siege guns and two 7-inch steel breech-loading siege howitzers, mounted on their proper carriages. The guns and howitzers are completed and ready for delivery, but the carriages are not yet ready. New platforms will be required for these guns, and all these supplies will be furnished by the Ordnance Department.

The following mortars and beds are in the mortar battery: Six 10-inch smoothbore mortars, mounted on their beds. These mortars are also obsolete, and are to be

replaced by four 7-inch steel breech-loading siege mortars, mounted on their carriages of latest type, and by two 3.60-inch steel breech-loading field mortars mounted on their carriages. The date of delivery of these mortars and their carriages is uncertain.

The field batteries.—There is one complete field battery, composed of six 3.20-inch steel breech-loading rifles complete, mounted on the latest type of field carriage, with limbers and caissons complete. This battery is used for light artillery drill. There is also a battery of four 3.20-inch steel breech-loading field guns, mounted on the latest type of gun carriage, with limbers complete, but the caissons of this battery are of the old pattern and belong to an old 3-inch battery. This battery is used for foot artillery drill.

As soon as the new model 3.20-inch steel guns for metallic ammunition are ready the six pieces will be replaced by them, and the present wood caissons and limbers will be replaced by those of steel.

Machine guns.—There are also at the post the following machine guns, which have been supplied partly by the Ordnance Department and partly by purchase from appropriations made by Congress; they are used in the practical instruction of cadets: One Gatling gun, caliber .45, model of 1875; one Gatling gun, caliber .45, model of 1883; one Gatling gun, caliber .30, model of 1895; one Gardner gun, caliber .45; one Maxim automatic gun, caliber .45; one Hotchkiss revolving cannon, caliber 1.50.

Rapid-fire guns.—There are also the following rapid-fire guns, which have been supplied by the Ordnance Department or purchased from appropriations made by Congress for the purpose; these guns are used for the practical instruction of cadets: One Hotchkiss mountain gun, caliber 1.65 inches; one Hotchkiss rapid-fire gun, 3-pounder; one Nordenfelt rapid-fire gun, 3-pounder; one Driggs-Schroeder rapid-fire gun, 6-pounder. In addition to the above, one Maxim semiautomatic rapid-fire gun has been ordered from the Maxim Company, appropriation for that purpose having been made at the last session of Congress.

SMALL ARMS.

The Department has on hand samples of the small arms and ammunition of a number of the leading foreign nations, and efforts are constantly being made to obtain these different arms for the purposes of comparison and study, and also for the museum. It is important that the Academy should have a sample of each of these arms, to enable the cadets to study practically their features, advantages, and defects, and compare them with our own gun.

MODELS OF SERVICE GUNS AND CARRIAGES.

The Department now has on hand models of all the service, field, siege, and seacoast guns and their carriages, with the exception of a mortar carriage of the first type and one of the field carriages. These models were made at the Watervliet, Watertown, and Rock Island arsenals, and have proved to be of the greatest use and importance, as they are kept in the recitation rooms while the guns and carriages are being studied, and the cadets are thus enabled to become thoroughly familiar with the details of their mechanism. It is hoped that the necessary appropriations to complete these models will be recommended.

MUSEUM.

The work of fitting up the new museum in the academic building is nearly completed. The room is to be painted, and the collection catalogued. After this is done a small annual appropriation will be required to keep the models in repair, and to do the necessary work required in making additions to the collection.

With reference to the armament of the post, it is believed that, with the exception of the siege and mortar batteries and the wood caissons of the field battery, it is in a satisfactory condition.

Owing to the very short range attainable here for heavy guns, the vicinity of towns and railroads, and the number of vessels constantly passing on the river, it is believed that it would be unsafe to attempt to fire with the modern high-power guns, and hence types of these guns have, with the approval of the Superintendent, been placed in the seacoast battery, and the older guns of less power, mounted on the latest improved carriages, have been retained for target practice. By this means safety is insured; all cadets are given a sufficient amount of target practice, and all become familiar with the modern guns by seeing and handling the models, and by having a type of each class of gun mounted in the battery. Those cadets, whose duties require a more detailed knowledge of the modern high-power gun obtain this knowledge at Fort Monroe, and at the various artillery posts after graduation.

RECOMMENDATIONS.

I have the honor to recommend:

First. That the appropriation for model carriages be continued to complete the collection. The amount required is about $2,500.

Second. An annual appropriation of $300 for keeping the museum in repair, purchasing and fitting up new models, etc.

Third. The complete armament of the siege guns and siege mortar battery as proposed.

Very respectfully, your obedient servant,

LAWRENCE L. BRUFF,
Captain, Ordnance Department, U. S. A.,
Instructor of Ordnance and Gunnery.

The CHAIRMAN OF THE COMMITTEE ON ARMAMENT, etc.
(Through headquarters U. S. Military Academy.)

APPENDIX B.

WEST POINT, N. Y., *June 8, 1897.*

SIR: Complying with your request of this date, I have the honor to submit the following suggestions concerning the local water supply:

During recent years the volume of stored water has been entirely insufficient for the needs of the post. This deficiency in quantity has been remedied by the building of the new reservoir southeast of Fort Putnam, which, at the flow line, will store about 92,000,000 United States gallons, or about six months' supply at the maximum rate of consumption. At present this reservoir contains about 82,000,000 gallons.

The supply of water is derived from the mountain areas surrounding the post. These areas are free from animal pollution, but abound in vegetable matter, living and dead, while there are only scant deposits of sand and gravel to filter the water on its way to the streams. The latter are small and generally go dry for several months every summer and fall. Filtration proves that the water holds some vegetable matter in suspension, while analyses show that there is at times the same kind of matter in solution.

To place the water above suspicion as a cause of malaria, it has been decided to subject the whole daily consumption to natural sand filtration at a moderate rate per acre per day.

Congress has appropriated $25,000 of the $40,000 estimated as necessary for constructing and putting in operation the necessary filters. The $15,000 not yet appropriated will be included in my estimates for the coming fiscal year.

The estimates named will also include an item of $10,000 for removing an area of shallow flowage from the east side of the new reservoir, for providing fencing and parapet walls for the roads bounding the same reservoir, and for necessary repairs, fencing, and cleaning at some of the other reservoirs.

An item of $3,000 will also be submitted for building a dwelling for the keeper of the new reservoir and new filters.

With the appropriations now available, and those to be estimated for this year, the latter amounting to about $28,000, it is my opinion that the water works can be placed in condition to supply an ample volume of water which should be safe and pure beyond suspicion, and at such increased head as will allow of adequate direct fire pressure at all of the important buildings except the observatory.

Upon the completion of the work thus outlined, it will be possible to abandon as sources of water and ice supply several of the small reservoirs which are now leaky and too low to give suitable pressures or difficult to maintain in sanitary condition, as well as some very old mains which are so badly rusted as to be practically unserviceable. The work of construction begun in 1893, and intended to be completed with appropriations to be made next winter, will constitute in itself almost a new and complete system of water supply and purification, which should be sufficient to last for a long term of years.

Very respectfully,

JAS. L. LUSK,
Captain, Corps of Engineers,
In charge of Water Supply.

Hon. J. E. WASHINGTON, *Secretary Board of Visitors.*
(Through headquarters U. S. Military Academy.)

ADDRESS OF HON. HUGH R. BELKNAP.

GENTLEMEN OF THE GRADUATING CLASS:

I give to you as my dearest sentiment, "The fittest place where man can die is where he dies for man."

I hardly know in what language to express my sincere gratitude for the honor of addressing you, for, standing in the presence of such a company, my heart is full, while my lips are almost dumb as my mind reverts to an occasion of like character, almost a quarter of a century in the past, when I heard him whose name I bear and whose memory I revere, and whose heart for this Academy and its graduates was ever filled with earnest interest and high regard, address the then graduating class.

But that was yesterday; to-morrow is before us. In a soldier's life it is, as it should be, cheers for the living and tears for the dead; to the grave a dirge, a quickstep back to quarters.

All the world honors men who go to war, and "None but the brave deserves the fair." The poet who told the truthful story in this line, which runs through all men's lives, builded better than he knew, but just as he would have formed his words could he have seen the future. The eyes which in bright beauty glisten their affection from this grove, the fair hands which wave to you in honor, the smiles which each man gathers and cherishes as his, and his alone, all tell to you that, by work which duty demands, by persevering effort, you have won the glad acclaim of those who are now here to meet and greet you.

"None but the brave deserves the fair."

In that wonderful City by the Lakes, from which I proudly hail, a few years since was celebrated the four hundredth anniversary of our continent's birth. There were gathered the people from all countries and all climes; there was shown the most marvelous exhibit of the fruits, of the sciences, and the arts the world has ever known. Such a sublime event was made possible by the united efforts of a reunited people.

The war is over. Time, with unrelenting finger, points to the dial, and with amazement we read "Anno Domini one thousand eight hundred and ninety-seven."

Over thirty years have come and gone since the Union's former valiant foes laid down their arms to that magnanimous chieftain, the Old Commander, the nation's hero, Ulysses S. Grant, who by his matchless military genius gave to European nations lessons in the art of war and to our nation peace.

Old ideas and hatreds have vanished in the dim shadows of the past; the watchword of the nation is now "Onward and upward." The South stretches forth her arms and bids welcome to the North; the North, gratefully appreciating the kind invitation, gladly sends her muscle, her manhood, and her capital to develop earth's hidden treasures of the Southern States and to make their fields blossom as the rose.

With a heart full of gratitude to the God of all that we have reached this happy epoch in our career, the American people look to you, who come from every section of our beloved country, to see to it that the principles represented by the Stars and Stripes, the dearest flag that waves, always triumph.

Thrones are tottering, crowned heads are trembling, dynasties are falling. The people of the Old World look to our young Republic for all that is good in government; and you, who have been educated at the nation's cost, must do your very best to make this the government of the people, by the people, and for the people.

Some seem to think that patriotism is dying out, that love of country is diminishing; but this can not be. On the heathered hills of Scotland the sword of Wallace is yet a bright tradition; the genius of France, in its brilliant literature of the day, still pays its high homage to the Young Maid of Orleans; on the mountains and in the valleys of the picturesque Republic of Switzerland the story of William Tell is still rehearsed and his memory most highly honored; and here, in our own fair land, if anyone, be he citizen of this grand Republic, or be he one who bends the knee to foreign prince or potentate, dare insult the Stars, he shall bear the Stripes.

If the prophecies of the future are realized all systems of warfare will be changed most thoroughly and the better plan of arbitration will be forced upon the world. When dynamite can be used to its full power, when shells are utilized whose contents when distributed bring certain death to every living thing, animal or vegetable, within the radius of its consuming vapor, the time will be hastened when war will be no more.

You have been trained to war, and until the world knows naught but peace you must hold yourselves in readiness to wage most bitter conflict; for, though hearts are pitiful, war is pitiless. The more severe the struggle, the sooner the triumphant end.

By the knowledge acquired in this Academy, and gaining inspiration from the noble deeds of those who have gone before, you will be nerved and enabled to press on for right and justice until you receive your summons to the undiscovered country; to press on until you reach the gates of the eternal city; to press on as, with your faces toward the flag, you march up the golden streets; to press on until you stand before the great white throne, in the presence of Him who is not only the God of Battles but the Prince of Peace, and there, in the midst of the immortal spirits of the soldier dead, when you are called upon to

render up your stewardship, you will gladly turn to this lovely banner of the Union, and, with pride, pointing to its bright Stripes and glistening Stars, in one voice acclaim:

"In this sign we conquer."

The hour has come; friends wait to welcome you; fathers, mothers, sisters, and lots of other fellows' sisters, extend their loving arms. This whole assemblage joins with me in wishing that the felicities of life and the blessings of Heaven may be yours in the fullest measure.

There may be times in your lives when some strain of music whose air has not come to you for years will bear you at once far back to these attractive scenes of other days where the same air was heard. The friends and the classmates who were with you here, the duties and the surroundings of a forgotten but then recalled hour in the dear delightful past will be with you once again, revived by the melody of that music whose magic power brings the forms and familiar faces of the loved of other days once more into your presence. Then will you reconsecrate your lives and your best endeavors to perpetuate for all time to come the splendid institutions of free America.

Gentlemen of the graduating class I beseech you, Guard well the Republic.

UNITED STATES MILITARY ACADEMY.

ANNUAL REPORT

OF THE

SUPERINTENDENT UNITED STATES MILITARY ACADEMY.

HEADQUARTERS U. S. MILITARY ACADEMY,
West Point, N. Y., September 23, 1897.

GENERAL: I have the honor to submit this my annual report for the Military Academy for the year ending September 1, 1897.

PERSONNEL.

The number of officers and instructors on duty at West Point September 1, 1897, was 7 professors, 1 associate professor, 55 commissioned officers, 1 chaplain, 1 sword master, and 1 teacher of music; a total of 66. (See roster appended, marked A.) The number September 1, 1896, was the same. In all, 18 officers joined during the year and 18 were relieved.

The number of cadets present and absent September 1, 1897, was 338, including 1 foreigner receiving instruction by special authority of Congress. This is the largest number of cadets thathas ever belonged to the Academy at one time. The number September 1, 1896, was 332, including 1 foreigner. During the year 48 were discharged for deficiency in studies, 1 discharged for disability, 6 resigned, and 68, including 1 foreigner, were graduated, a total loss of 123, while there were admitted in all at the examinations held in March, June, and August, 129. For the three examinations referred to there were appointed in all 316 candidates, including 128 alternates and 1 foreigner. Of these, 43 failed to appear, 4 left before the completion of the examination, and 117 were found not duly qualified, either mentally or physically, or both. Of the remaining 152, including 1 foreigner, who passed, 23 were alternates whose principals also passed, and for whom there were therefore no vacancies, leaving 129 who were admitted.

The number of cadets now authorized by law is 371. There are therefore 34 vacancies. There will be many more before the end of the academic year. It is not possible to keep the corps of cadets full. I renew the recommendation of former reports that a moderate increase be made in the number authorized by law, such for example as would be obtained by appointing two at large from each State to be nominated by the Senators representing the State in Congress.

ACADEMIC DEPARTMENTS.

The heads of the various departments of instruction have kept abreast of all advances made in their special branches of knowledge and have not failed to introduce improvements when opportunity offered. In

the department of chemistry a new text-book upon chemistry, specially prepared by Professor Tillman for the use of cadets, was substituted for the book formerly in use. In the department of law and history Fisher's Outlines of Universal History was substituted for Myer's General History, Andrews Manual of the Constitution for Cooley's Constitutional Law, and the Elements of Law, specially prepared for the use of cadets by Professor Davis, was substituted for the Introduction to the Study of Law by the same author.

By the act approved February 10, 1897, it was provided that the senior assistant instructor of ordnance and gunnery receive the pay of captain mounted, as had previously been the rule with nearly every other department. The department of practical military engineering is now the only one in which the senior assistant receives no extra compensation. It seems but just that it should be placed upon the same footing in this respect as the others, and that the senior assistant should receive the pay of captain mounted.

THE LIBRARY.

During the year ending August 31, 954 volumes were purchased for the library and 375 volumes were presented to it, making a gain of 1,329 volumes. There being on hand a large number of duplicate copies of O'Connor's Science of War and Fortification, copies were sent, with the approval of the honorable Secretary of War, to the libraries of the War Department and of every military post in the country and to the officers on duty at West Point, the number of volumes thus distributed being 372. The net gain during the year was 957 volumes, besides 377 pamphlets, making the total number in the library September 1, 1897, 40,098 volumes and 6,509 pamphlets. There are in the library also large numbers of maps and charts, but these are now almost wholly unavailable for want of space to properly store and display them.

As stated in former reports, the library has entirely outgrown the space heretofore allotted to it, and one of the most pressing needs of the Academy is the reconstruction of the library building. The need becomes more and more pressing each year. Full plans, specifications, and estimates for the work have been prepared. The necessity and urgency of this work is explained in the report of the librarian, hereto appended, marked B. The recommendation contained in former reports that the salary of the assistant librarian be increased from $1,200 to $1,500 per annum is renewed.

HEALTH.

The health of the command during the year was decidedly better than during the year before. There were, however, many cases of malarial fever and of influenza. Several cases of scarlet fever and of typhoid fever occurred, but by careful quarantine arrangements the diseases were prevented from spreading. Five deaths occurred among the civilians residing upon the post. One enlisted man, Sergt. Anthony Brechbiel, of Company E, Battalion of Engineers, lost his life in a gallant attempt to rescue others from drowning. The sanitary condition of the post is generally excellent. The principal exception is the cavalry barrack, and in that case the proper remedy is being applied under an appropriation made for the purpose, by the removal of enough of the rock on the west and north of the building to provide proper ventilation and drainage.

The report of the post surgeon is hereto appended, marked C.

DISCIPLINE AND DRILL.

The state of discipline and drill of the corps of cadets has been maintained at its usual high standard. On the 27th of April last the corps proceeded to New York and took a highly creditable part in the parade at the dedication of the Grant tomb.

ACCOUNTS AND SUPPLIES.

Attention is invited to the report of the quartermaster and commissary of cadets, hereto appended, marked D. The cost of subsistence during the year averaged a trifle over 52 cents per man per day, which is a slight reduction from the cost of the year before, while there was no reduction in the quality, variety, or abundance of the food provided. The other supplies furnished to cadets were of good quality, and the prices usually low. Further improvements were made in the management and in the outfit of the laundry.

ORDNANCE.

Important additions were made to the list of models and sample guns for the general theoretical instruction of cadets. The work of arranging the museum was completed, and the preparation of a classified catalogue was begun. Attention is invited to the report of the instructor of ordnance and gunnery, hereto appended, marked E.

I beg leave to repeat my remarks of last year upon the subject of the band and the master of the sword.

BAND.

By the act of March 3, 1877, the Military Academy band was reduced to one teacher of music and 24 enlisted men, which is its present authorized strength. Of the enlisted men six receive $34 per month, six $20, and the remaining twelve $17, with the usual allowances of enlisted men. At the time of this reduction the band consisted of 1 teacher of music and 40 enlisted musicians, of whom 10 received $34, and the remaining 30 received $30 per month, with the usual allowances of enlisted men. Since that date every Superintendent of the Academy, with perhaps one exception, and many or all Boards of Visitors have recommended an increase of the band. To any one familiar with music it needs no argument to prove that the present numbers and pay are not sufficient. Is a good band really necessary to the practical efficiency of the Academy? is the only question which can be asked. The answer is plain when the purpose which the band subserves is considered. Military pomp has a serious and practical object—the cultivation of the military spirit. It is in the same category with patriotic songs, discipline, and monuments to dead heroes. There is no more essential part of it than good music. I recommend that the band be restored to the numbers and pay which it had before the reduction in 1877. I recommend further that the leader receive the rank, pay, and emoluments of a second lieutenant of infantry. The increase is desired, not for the purpose of gratifying an idle vanity or merely to provide pleasure, but to improve the finer polish given to the finished product of the Academy.

MASTER OF THE SWORD.

The sword master is also the instructor in gymnastics and swimming. He is a civilian, appointed by the Secretary of War. The present incumbent has worked up an admirable course of gymnastics for the

corps of cadets. His system of calisthenics has been adopted by the War Department for the use of the Army. He is required to preserve discipline and to exercise control of cadets while under his instruction. It would greatly strengthen his hand if he should have military rank, and, in view of the great and increasing importance of his department, I recommend that legislation be solicited giving him the rank, pay, and emoluments of a first lieutenant of infantry.

WATER SUPPLY.

In connection with the new reservoir, work was continued upon the main dam, the paving of the top and the construction of the overflow and spillway being nearly completed, and good progress was made in reclaiming the swamp west of the reservoir. The collection of water in the reservoir was begun in November, and during the winter it was filled. The excavation for the filter beds was completed and building the outside walls was begun. The new 12-inch main to supply the portion of the post south of the Academy building was laid, and the 6-inch branch to the new south gate was purchased and its laying nearly completed. Estimates are submitted for the completion of the dam and filter beds, and of the roadways, fences, keeper's dwelling, and other improvements connected with the reservoir. For further details attention is invited to the report of the instructor of practical military engineering, hereto appended, marked F.

BUILDINGS AND GROUNDS.

Improvement of the new portion of the post cemetery was begun. A new and additional entrance was constructed. The dilapidated old wall upon the south side was demolished and the work of reconstructing it upon a new and better line made good progress.

The old surface cable railway for transporting coal from the north dock to the top of the hill having been worn out was demolished. It is being replaced by a suspension cable way leading in a straight line from the coal shed at the top of the hill to a new dock constructed for the purpose, a short distance east of the old dock. It is to be worked by electric motors. A dock in the new location makes it possible to suspend the cable in a single straight line without interfering with the fire of the seacoast mortars. The new dock and the steel suspension tower resting upon it are completed. Work upon other portions of the structure is well advanced and progressing satisfactorily. It is expected that it will be completed before the arrival of the winter supply of coal.

A contract was let March 16, 1897, to Messrs. Dooley & Ayers, for the construction of the new guardhouse and gates near the southern boundary of the reservation to control the main entrance to the post from that direction. By the 1st of September the outer walls of the building were completed. It is expected that the guardhouse will be ready for occupation and the gates be completed at an early day.

A latrine for the use of the public, located below the level of the road northeast of the library building, was begun and nearly completed.

An addition to the schoolhouse for soldiers' children was built, providing a much-needed additional schoolroom.

A neat wooden building to accommodate the public photographer and the central telephone office was begun in rear of the gymnasium building and was nearly completed.

Many minor improvements were made. Attention is invited to the report of the quartermaster, hereto appended, marked G.

MEMORIAL HALL.

Work upon the construction of the Memorial Hall, which was begun in February, 1896, continued until about the end of November, when the contractors failed. As this happened near the close of the working season no very serious delay resulted. Arrangements were made with the American Surety Company, the contractors' bondsmen, to proceed with the work, which they did when the season opened in the spring. By the 1st of September the outer walls were completed and the iron-work of the roof in place. The work is now being energetically pushed. It can not be completed within the time fixed in the contract, December 1, 1897, but there should be no difficulty in completing it before June. Among my estimates this year is an item for a granolithic walk to connect this building with the system of paved walks of the post.

BATTLE MONUMENT.

One of the most interesting events of the year was the dedication on Memorial Day of the Battle Monument, the completion of which was mentioned in my last annual report. This monument was erected with funds provided by the voluntary subscription of 670 officers and 790 men of the Regular Army, representing all branches of the service, and civilian employees of the quartermaster's department in New Orleans. The total amount paid in was $14,856.54, of which $14,393.54 was subscribed in 1864, and the balance within the few subsequent years, the last subscription being one of $15 in 1871. The money was carefully invested in bonds. By the year 1890, when active steps for building the monument were inaugurated, the fund had by the accumulation of interest been increased to about $63,000. The monument bears the names of 188 officers and 2,042 enlisted men, being all of the Regular Army who were killed in battle or died of wounds received in battle during the war of the rebellion. Artistically it represents the genius of architects and a sculptor who have no living superiors. Its site is as commanding as any to be found here or perhaps anywhere. The dedication ceremonies were designated by the committee to be, and in fact were, entirely worthy of the monument. A full report of the proceedings, and of the previous history of the enterprise, is being prepared by the committee for publication and distribution to the Army.

ESTIMATES.

The estimates for the next fiscal year are, except for the omission of certain improvements provided for by Congress in the last appropriation bill, essentially the same as those of last year. They have been carefully prepared and are commended to favorable consideration. The necessity of each item is explained in the remarks attached thereto.

CONCLUSION.

In conclusion, I have to report that the Military Academy is doing the work assigned to it as thoroughly now as at any period of its history. Its equipment is better than it ever was before, and its professors

and officers are characterized by the same ability, industry, zeal, and patriotism for which they have always been distinguished.

Very respectfully, your obedient servant,

O. H. ERNST,
Colonel of Engineers, Superintendent.

The ADJUTANT-GENERAL U. S. ARMY,
Washington, D. C.

LIST OF APPENDIXES.

A.—Roster.
B.—Report of librarian.
C.—Report of post surgeon.
D.—Report of quartermaster and commissary of cadets.
E.—Report of instructor of ordnance and gunnery.
F.—Report of instructor of practical military engineering.
G.—Report of quartermaster of the Military Academy.

A.

UNITED STATES MILITARY ACADEMY,

WEST POINT, NEW YORK.

SUPERINTENDENT.

Col. O. H. ERNST, Lieutenant-Colonel, Corps of Engineers.

MILITARY STAFF.

Capt. WILBER E. WILDER, Fourth Cavalry, adjutant of the Military Academy and of the post; recruiting officer; commanding band and detachment of field music.

Capt. WILLIAM F. SPURGIN, Twenty-first Infantry, treasurer of the Military Academy and quartermaster and commissary of cadets.

Capt. JOHN B. BELLINGER, assistant quartermaster, U. S. A., quartermaster of the Military Academy and of the post; disbursing officer.

First Lieut. WILLIAM WEIGEL, Eleventh Infantry, assistant to the quartermaster, and officer of police.

Second Lieut. HAROLD P. HOWARD, Sixth Cavalry, commissary and treasurer; in charge of post exchange.

Maj. GEORGE H. TORNEY, surgeon, U. S. A., surgeon.

Capt. CHARLES F. MASON, assistant surgeon, U. S. A.

Capt. FRANCIS A. WINTER, assistant surgeon, U. S. A.

ACADEMIC STAFF.

Professors whose service at the Academy, as professor, exceeds 10 years have the assimilated rank of colonel, and all other professors the assimilated rank of lieutenant-colonel.

DEPARTMENT OF TACTICS.

Lieut. Col. Otto L. Hein, captain, First Cavalry, commandant of cadets and instructor of tactics (15 June, 1897).

Capt. James Parker, Fourth Cavalry, senior instructor of cavalry tactics.

First Lieut. Granger Adams, Fifth Artillery, senior instructor of artillery tactics.

First Lieut. John H. Beacom, Third Infantry, senior instructor of infantry tactics, commanding company of cadets.

First Lieut. Samson L. Faison, First Infantry, assistant instructor of tactics, commanding company of cadets.

First Lieut. John J. Pershing, Tenth Cavalry, assistant instructor of tactics, commanding company of cadets.

Second Lieut. Jay E. Hoffer, Third Artillery, assistant instructor of tactics, commanding company of cadets.

Second Lieut. Julian R. Lindsey, Ninth Cavalry, assistant instructor of cavalry tactics.

DEPARTMENT OF CIVIL AND MILITARY ENGINEERING.

Gustav J. Fiebeger, professor (4 May, 1896).

First Lieut. Thomas H. Rees, Corps of Engineers, assistant professor.

First Lieut. Francis R. Shunk, Corps of Engineers; First Lieut. Chester Harding, Corps of Engineers, instructors.

DEPARTMENT OF NATURAL AND EXPERIMENTAL PHILOSOPHY.

Peter S. Michie, professor (14 Feb., 1871).

Capt. William B. Gordon, Ordnance Department, assistant professor.

First Lieut. Henry C. Davis, Third Artillery; Second Lieut. Joseph T. Crabbs, Eighth Cavalry, instructors.

Second Lieut. Harold P. Howard, Sixth Cavalry, in charge of observatory and astronomical observations.

DEPARTMENT OF MATHEMATICS.

Edgar W. Bass, professor (17 Apr., 1878).
Wright P. Edgerton,[1] associate professor (1 July, 1893).
First Lieut. Charles P. Echols, Corps of Engineers, assistant professor.
Second Lieut. George Blakely, Second Artillery; Second Lieut. William M. Cruikshank, First Artillery; Second Lieut. David M. King, Fourth Artillery; Second Lieut. William P. Pence, Fifth Artillery; Second Lieut. Charles W. Castle, Sixteenth Infantry; Second Lieut. Thales L. Ames, Third Artillery; Second Lieut. Joseph Wheeler, jr., Fourth Artillery, instructors.

DEPARTMENT OF CHEMISTRY, MINERALOGY, AND GEOLOGY.

Samuel E. Tillman, professor (21 Dec., 1880).

First Lieut. Edgar Russel, Fifth Artillery, assistant professor.
First Lieut. George F. Landers, Fourth Artillery; Second Lieut. Palmer E. Pierce, Sixth Infantry; Second Lieut. William R. Smith, First Artillery, instructors.

DEPARTMENT OF DRAWING.

Charles W. Larned, professor (25 July, 1876).
Second Lieut. Horace M. Reeve, Third Infantry, assistant professor.
Second Lieut. Walter C. Babcock, Eighth Cavalry; Second Lieut. Jens Bugge, Third Infantry; Second Lieut. Charles H. Paine, Thirteenth Infantry, instructors.

DEPARTMENT OF MODERN LANGUAGES.

Edward E. Wood, professor (1 Oct., 1892).
First Lieut. Charles H. Hunter, First Artillery, assistant professor of the Spanish language.
First Lieut. Peter E. Traub, First Cavalry, assistant professor of the French language.
Second Lieut. Samuel C. Hazzard, First Artillery; Second Lieut. William R. Smedberg, jr., Fourth Cavalry; Second Lieut. Edward B. Cassatt, Fourth Cavalry; Second Lieut. James M. Williams, First Artillery; Second Lieut. Francis Le J. Parker, Fifth Cavalry, instructors.

DEPARTMENT OF LAW AND HISTORY.

George B. Davis, lieutenant-colonel and deputy judge-advocate-general, U. S. A., professor (20 Aug., 1895). (By assignment under act 6 June, 1874.)
First Lieut. Walter A. Bethel, Third Artillery, assistant professor.
Second Lieut. Frank G. Mauldin, Third Artillery; Second Lieut. Mathew C. Smith, Second Cavalry; Second Lieut. Samuel Hof, Sixth Cavalry, instructors.

DEPARTMENT OF PRACTICAL MILITARY ENGINEERING, MILITARY SIGNALING, AND TELEGRAPHY.

Capt. James L. Lusk, Corps of Engineers, instructor (31 Mar., 1893).
First Lieut. E. Eveleth Winslow, Corps of Engineers, assistant instructor.

DEPARTMENT OF ORDNANCE AND GUNNERY.

Capt. Lawrence L. Bruff, Ordnance Department, instructor (17 Aug., 1891).
First Lieut. John T. Thompson, Ordnance Department, senior assistant instructor.
Second Lieut. Henry D. Todd, jr., Third Artillery, assistant instructor.

CHAPLAIN.

Rev. Herbert Shipman (22 Apr., 1896).

Herman J. Koehler, master of the sword.
George Essigke, teacher of music.

[1] Associate professor with the rank of captain.

List of officers, with relative rank at the United States Military Academy.

Name.	Corps or regiment.	On duty at Academy since—
Colonels.		
Ernst, Oswald H	Corps of Engineers	Apr. 1, 1893
Michie, Peter S	Professor (Feb. 14, 1871)	Apr. 23, 1867
Larned, Charles W	Professor (July 25, 1876)	Aug. 28, 1874
Bass, Edgar W	Professor (Apr. 17, 1878)	Sept. 15, 1876
Tillman, Samuel E	Professor (Dec. 21, 1880)	Aug. 28, 1879
Lieutenant-colonels.		
Wood, Edward E	Professor (Oct. 1, 1892)	Aug. 28, 1889
Davis, George B	Professor (Aug. 20, 1895)	Aug. 20, 1895
Fiebeger, Gustav J	Professor (May 4, 1896)	May 30, 1896
Hein, Otto L	Captain First Cavalry, commandant of cadets	June 15, 1897
Major.		
Torney, George H	Surgeon, Medical Department	July 17, 1894
Captains.		
Spurgin, William F	Twenty-first Infantry	Sept. 2, 1881
Lusk, James L	Corps of Engineers	Mar. 31, 1893
Parker, James	Fourth Cavalry	Aug. 13, 1894
Bruff, Lawrence L	Ordnance Department	Aug. 17, 1891
Wilder, Wilber E	Fourth Cavalry	May 15, 1895
Gordon, William B	Ordnance Department	Aug. 20, 1894
Edgerton, Wright P	Associate professor (July 1, 1893)	Jan. 28, 1889
Mason, Charles F	Assistant surgeon, Medical Department	July 16, 1894
Bellinger, John B	Assistant quartermaster, Quartermaster's Department.	Sept. 17, 1894
Shipman, Herbert	Chaplain (Apr. 22, 1896)	Apr. 25, 1896
Winter, Francis A	Assistant surgeon, Medical Department	Apr. 5, 1897
First lieutenants.		
Adams, Granger	Fifth Artillery	July 15, 1895
Beacom, John H	Third Infantry	Aug. 31, 1897
Hunter, Charles H	First Artillery	Aug. 20, 1896
Rees, Thomas H	Corps of Engineers	Aug. 22, 1893
Thompson, John T	Ordnance Department	Aug. 20, 1896
Davis, Henry C	Third Artillery	Do.
Shunk, Francis R	Corps of Engineers	Aug. 20, 1895
Faison, Samson L	First Infantry	Oct. 22, 1896
Pershing, John J	Tenth Cavalry	June 15, 1897
Traub, Peter E	First Cavalry	Nov. 11, 1892
Russel, Edgar	Fifth Artillery	Aug. 22, 1893
Landers, George F	Fourth Artillery	Aug. 20, 1897
Winslow, E. Eveleth	Corps of Engineers	May 12, 1896
Weigel, William	Eleventh Infantry	Apr. 9, 1894
Harding, Chester	Corps of Engineers	Aug. 20, 1896
Echols, Charles P	do	Aug. 20, 1895
Bethel, Walter A	Third Artillery	Aug. 20, 1894
Second lieutenants.		
Todd, Henry D., jr	Third Artillery	Aug. 20, 1894
Mauldin, Frank G	do	Aug. 20, 1896
Howard, Harold P	Sixth Cavalry	June 15, 1897
Crabbs, Joseph T	Eighth Cavalry	Sept. 7, 1896
Pierce, Palmer E	Sixth Infantry	Aug. 20, 1895
Blakely, George	Second Artillery	Aug. 20, 1896
Hoffer, Jay E	Third Artillery	Do.
Smith, William R	First Artillery	Nov. 11, 1895
Reeve, Horace M	Third Infantry	Aug. 20, 1895
Lindsey, Julian R	Ninth Cavalry	Nov. 27, 1896
Cruikshank, William M	First Artillery	Aug. 28, 1895
King, David M	Fourth Artillery	Aug. 20, 1896
Hazzard, Samuel C	First Artillery	Aug. 20, 1895
Smedberg, William R., jr	Fourth Cavalry	Aug. 20, 1896
Babcock, Walter C	Eighth Cavalry	Do.
Smith, Mathew C	Second Cavalry	Aug. 20, 1897
Cassatt, Edward B	Fourth Cavalry	Aug. 20, 1895
Pence, William P	Fifth Artillery	Aug. 20, 1897
Williams, James M	First Artillery	Aug. 20, 1896
Hof, Samuel	Sixth Cavalry	Aug. 20, 1897
Castle, Charles W	Sixteenth Infantry	Do.
Parker, Francis Le J	Fifth Cavalry	Do.
Bugge, Jens	Third Infantry	Do.
Paine, Charles H	Thirteenth Infantry	Do.
Ames, Thales L	Third Artillery	Do.
Wheeler, Joseph, jr	Fourth Artillery	Do.

TROOPS.

Battalion of cadets.

Lieut. Col. Otto L. Hein, captain, First Cavalry, commanding.
Company A, First Lieut. John J. Pershing, Tenth Cavalry, commanding.
Company B, Second Lieut. Jay E. Hoffer, Third Artillery, commanding.
Company C, First Lieut. John H. Beacom, Third Infantry, commanding.
Company D, First Lieut. Samson L. Faison, First Infantry, commanding.

Hospital corps.

Maj. George H. Torney, surgeon, U. S. A., commanding.
Capt. Charles F. Mason, assistant surgeon, U. S. A.
Capt. Francis A. Winter, assistant surgeon, U. S. A.

United States Military Academy detachment of Army service men.

Capt. John B. Bellinger, A. Q. M., quartermaster, commanding.
First Lieut. William Weigel, Eleventh Infantry.

Company E, battalion of engineers.

Capt. James L. Lusk, Corps of Engineers, commanding.
First Lieut. E. Eveleth Winslow, Corps of Engineers.

United States Military Academy detachment of ordnance.

Capt. Lawrence L. Bruff, Ordnance Department, commanding.
First Lieut. John T. Thompson, Ordnance Department.

United States Military Academy detachment of cavalry.

Capt. James Parker, Fourth Cavalry, commanding.
Second Lieut. Julian R. Lindsey, Ninth Cavalry.

United States Military Academy band and detachment of field music.

Capt. Wilber E. Wilder, Fourth Cavalry, commanding.

HEADQUARTERS U. S. MILITARY ACADEMY,
West Point, N. Y., September 1, 1897.

Official:
W. E. WILDER,
Captain, Fourth Cavalry, Adjutant.

B.

LIBRARY UNITED STATES MILITARY ACADEMY,
West Point, N. Y., August 25, 1897.

The ADJUTANT UNITED STATES MILITARY ACADEMY.

SIR: I have the honor to submit the following report in accordance with the provisions of Circular No. 26, Headquarters United States Military Academy, West Point, N. Y., August 4, 1897:

The increase of the library during the past year is as follows:

Number of volumes in library September 1, 1896	39,141
Number of volumes purchased up to August 31, 1897	954
Number of volumes presented to the library to August 31, 1897	375
Making a total of	40,470
By direction of the War Department copies of O'Connor's Science of War and Fortification were sent to the War Department library, to the libraries of every military post in the country, and to the officers on duty at West Point, amounting in all to	372
Leaving the total volumes in library September 1, 1897	40,098

The number of pamphlets in the library on September 1, 1896, was 6,132, to which there have been added during the year 377, making a total now in the library of 6,509 pamphlets.

The card cataloguing of the books of the library has been continued by Dr. Otto Plate, the assistant librarian, in the most intelligent and systematic manner, so that it is now possible for those who make use of the library to readily refer to any book contained in it. At the present time nearly 35,000 volumes have been classified, arranged upon their appropriate shelves, and catalogued by card, and there remains only about 5,000 volumes to complete the list. I can not speak too highly of the scholastic attainments, extensive literary knowledge, and peculiar fitness which make Dr. Plate so valuable as a librarian. Although designated as assistant, he very properly is deserving of all the reputation and the success which have accrued to the library in the past few years. The librarian proper under the Academy regulations is held responsible, but the active labors have been performed by the assistant, Dr. Plate, and I wish here to bear testimony to the great obligations which we all owe to him for his valuable services in so largely increasing the usefulness of the library to officers and cadets. I have heretofore earnestly recommended an increase in his compensation, and as a matter of simple justice to a valuable officer of the institution, I again renew my recommendation that his pay be increased to $1,500 per annum. His predecessor, who, while he was a faithful servant, possessed none of the literary qualifications required of a modern librarian, received for many years over $1,400 per annum, and it would therefore seem as a matter of equity that Dr. Plate should receive at least an equal compensation.

Nearly three years ago Congress provided an appropriation for the preparation of plans, specifications, and estimates for the renovation of the library building. In anticipation of the early action of Congress to make provision for this renovation no application has been made for repairs to the present building except in cases of extreme necessity. But if there is to be any further delay in carrying out this renovation it will become necessary to ask for a considerable sum to put the present building in complete repair, notwithstanding the fact that it does not serve the purposes of a modern library. It was built in 1841 for the main purpose of an observatory, of which a single large room was set apart for a library. In this room all the books were arranged on shelves, out of reach of the ordinary visitor, and the location of any books was known only to the attendants. The more important defects that at present exist are as follows, viz:

1. The roof is in a very bad condition, leaking in many places, especially in winter when the snow lies upon it for any time.
2. The ventilation is so imperfect that the attendants constantly complain that their health is affected. The underground cellar is damp and so illy ventilated that it affects the ventilation of the library room above.
3. The single library room is often so overcrowded during the hours when cadets are permitted to use the library that some provision should be made for additional room and facilities for officers. The book shelves are so badly contrived that more than three-fourths of the books are out of immediate reach of those who care to use the library.
4. The present system of lighting the library is exceedingly defective and should be remedied in the near future. The maps and drawings which the library possesses in great number are now almost wholly unavailable for ready reference for want of proper space to properly display them.

Thus the valuable assistance which the library should freely confer upon officers and cadets in aiding in their professional education is greatly curtailed by the defects of the present building. I therefore deem it my duty to submit a most earnest request that the renovation of the present building, which has already been carefully planned and determined upon, be asked for. In my opinion it is the most important need of the Academy at the present time and should no longer be deferred.

Very respectfully, your obedient servant,

P. S. MICHIE,
Professor of Philosophy, Librarian United States Military Academy.

C.

UNITED STATES MILITARY ACADEMY, CADET HOSPITAL,
West Point, N. Y., August 25, 1897.

To the ADJUTANT UNITED STATES MILITARY ACADEMY.

SIR: In compliance with the requirements of Circular No. 26, United States Military Academy, August 4, 1897, I have respectfully to submit the following statement of the work done in the medical department of the post of West Point, N. Y., during the fiscal year ending June 30, 1897.

The mean strength of the command is shown in the following table:

Officers	51.50
Cadets	298.58
Enlisted men	325.44
Civilians, officers and families, etc	164.25
Civilians, soldiers, and employees' families	511.50

The number of sick treated during the year was as follows:

Officers in quarters	26
Cadets in hospital	1,096
Cadets in quarters	3,250
Enlisted men in hospital and quarters	518
Civilians and officers' families who have received treatment from the cadet hospital	1,305
Civilians and soldiers' families who have received treatment from the soldiers' hospital	1,364
Number of recruits examined	115
Number of recruits accepted	73
Number of recruits rejected	42
Births	31
Discharged for disability	4
Deaths:	
Officers	0
Cadets	0
Enlisted men	1
Civilians	5

Besides the cases of sickness included in the above statement, there were many others which do not appear on record except in the form of a prescription entry in one of the dispensaries of the post.

The average daily population of the post entitled to medical attendance was 1,351.27.

The epidemic of malarial fever which prevailed throughout the garrison during the spring of 1896 continued during the summer months and ended in November. This disease again became epidemic in March, and continued up to the end of the fiscal year. The cases, however, were less in number than during the season of 1895–96. No mortality resulted from the disease, the type not being severe, except in a few cases.

Epidemic influenza made its appearance on the post in January and continued until April, after which no cases came under observation.

During the month of January several cases of mumps occurred in the engineer company, and others amongst the civilian population on the post. This disease continued during February, March, April, and May to affect the civilians living on the post.

In April, scarlet fever made its appearance in the family of an enlisted man of the army service detachment living on the reservation and attacked his four children, resulting in the death of one girl, aged 6 years. In May, two cases of this disease developed in the family of an enlisted man of the cavalry detachment. One death resulted from this outbreak.

Every effort was made to prevent the spread of this disease through the garrison, and no other cases occurred up to June 30.

It is probable that the infection in both families was imported from some adjacent city or town.

The infection in the four cases of typhoid fever—one adult and two children, civilians, and one soldier, who was admitted to the soldiers' hospital from furlough in the fifth week of the disease—was traced to the adjoining town of Highland Falls, in which they had resided before coming under observation.

Acute pharyngitis and acute follicular tonsillitis prevailed among the members of the corps of cadets during the winter and spring months and caused a large number of admissions to the sick report.

In addition to the care of the sick and disabled the supervision of the hygiene and sanitation of the post has been carried on by the surgeon, under the direction of the commanding officer, as provided in A. R. 1393.

Very respectfully,

GEO. H. TORNEY,
Major and Surgeon, U. S. Army.

D.

HEADQUARTERS UNITED STATES MILITARY ACADEMY,
OFFICE TREASURER, QUARTERMASTER, AND COMMISSARY OF CADETS,
West Point, N. Y., August 25, 1897.

The ADJUTANT UNITED STATES MILITARY ACADEMY,
West Point, N. Y.

SIR: I have the honor to submit the following relative to my duties as treasurer United States Military Academy, quartermaster and commissary of cadets, for the fiscal year ending June 30, 1897, referring to each duty under its heading:

TREASURER OF THE UNITED STATES MILITARY ACADEMY.

The business of the treasurer's office during the year necessitated the keeping of 28 accounts, which were settled and inspected every two months, and which are exhibited by name in statement No. 2 of this paper.

The following statement (No. 1) was the last one made in this office prior to the expiration of the fiscal year 1895–96, and shows the assets and liabilities at the date when made, May 21, 1896:

Statement No. 1.

Assets.	Amount.	Liabilities.	Amount.
Assistant treasurer	$34,546.37	Athletic association	$93.57
Cadet cash	7.50	Cadet laundry	1,257.02
Dentist	130.00	Cadet quartermaster	8,894.72
Miscellaneous fund	19.31	Cadet subsistence department	780.97
Trust funds	20,000.00	Corps of cadets	10,001.43
Cash on hand	784.37	Deposits	100.00
		Young Men's Christian Association	11.55
		Equipment fund	33,972.00
		Dialectic society	163.99
		Gas fund	212.30
Total	55,487.55	Total	55,487.55

The following statement (No. 2) enumerates the 28 separate accounts; exhibits the total receipts and disbursements under each, between date of statement No. 1, above given, and that of statement No. 3, May 20, 1897:

Statement No. 2.

No.	Name.	Receipts.	Disbursements.
1	Assistant treasurer	$173,772.39	$173,085.26
2	Athletic association	1,478.70	1,666.38
3	Balances paid	22,032.47	22,032.47
4	Barber	607.85	607.85
5	Cadet cash	13,864.70	14,009.70
6	Hospital	2,461.58	2,461.58
7	Cadet laundry	10,399.61	10,289.79
8	Cadet quartermaster's department	76,175.84	74,696.63
9	Cadet subsistence department	60,505.75	60,833.56
10	Confectioner	294.00	294.00
11	Corps of cadets	205,155.72	204,902.47
12	Damages, ordnance	17.74	17.74
13	Dancing	515.30	515.30
14	Dentist	1,017.00	1,017.00
15	Deposits	14,977.66	14,587.66
16	Young Men's Christian Association	336.00	170.80
17	Dialectic society	676.00	568.38
18	Equipment fund	14,014.00	16,146.00
19	Expressage	22.64	22.64
20	Gas fund	1,249.50	1,249.50
21	Hops and german	1,549.76	1,549.76
22	Miscellaneous fund	22.94	2.39
23	Miscellaneous items	879.32	879.32
24	Oath	27.00	27.00
25	Paymaster	173,086.76	173,086.76
26	Periodicals	3.35	3.35
27	Photographer	70.50	70.50
28	Policing barracks	5,344.21	5,344.21

In the foregoing statement there is shown, under the head of disbursements, in accounts Nos. 2, 4, 6, 7, 8, 9, 10, 12, 13, 14, 16, 17, 18, 19, 20, 21, 23, 24, 26, 27, and 28 the total amounts expended, out of their pay, for the support and other authorized expenses of the corps of cadets during the year.

The following statement (No. 3), dated May 20, 1897, was the last one made during the fiscal year ending June 30 last, and exhibits the assets and liabilities of the treasurer at the date given:

Statement No. 3.

Assets.	Amount.	Liabilities.	Amount.
Assistant treasurer	$33,859.24	Cadet laundry	$1,366.84
Athletic association	61.09	Cadet quartermaster	10,373.03
Cadet cash	152.50	Cadet subsistence department	453.16
Trust funds	20,000.00	Corps of cadets	10,254.68
Cash on hand	1,155.38	Deposits	490.00
		Young Men's Christian Association	176.75
		Equipment fund	31,840.00
		Dialectic society	271.61
		Miscellaneous fund	1.24
Total	55,228.21	Total	55,228.21

The members of the graduating class of 1897, 68 in number, were paid, on settlement of their accounts as cadets, $18,450.07, an average per cadet of $271.33.

The cadets going on furlough, 71 in number, were paid $7,065, an average per cadet of $99.50.

The 125 new cadets who entered this year deposited $11,224.91, an average of $89.79. This class was in debt on settlement of accounts, July 1, 1897, $4,375.68.

During the year there was paid to cadets discharged and resigned $5,151.49, of which $2,379 was for travel pay and $570.76 for transportation, the latter amount having been turned over to the treasurer by the quartermaster of the United States Military Academy for that purpose.

The expense to the corps of cadets for subsistence of cadets in hospital for the year ending April 30, 1897, was $2,461.58, an annual cost to each cadet of $7.85, or an average monthly cost per cadet of 65$\frac{5}{12}$ cents.

CADET QUARTERMASTER'S DEPARTMENT.

The following exhibits the work of the department during the year:

Articles.	Manufactured.	Repaired.	Articles.	Manufactured.	Repaired
Dress coats, cadets'	280	342	Officers' trousers	110	.....
Dress coats, officers'	5	.....	Officers' trousers, riding	1	.....
Fatigue coats, cadets'	500	683	Civilian clothing, suits	6	.....
Blouses, officers'	68	.....	White jackets	233	16
Overcoats, cadets'	160	356	Waiter jackets	34	21
Overcoats, officers'	7	.....	Civilians' overcoats	2	.....
Capes, officers'	9	12	White duck blouses	1	.....
Gray flannel trousers	142	.....	Chevrons	172	.....
Gray cloth trousers	573	709	Socks (pairs)	.....	3,740
Gray riding trousers	82	.....	Shoes (pairs)	.....	1,973
White duck trousers	1,150	1,211			

The foregoing, together with the supplying of articles of every description required by cadets, constituted the labor of the department during the year.

CADET SUBSISTENCE DEPARTMENT.

The subsistence of the cadets during the year has been most satisfactory as to quality, variety, abundance, and cost, the latter in the mess alone being for the year 50$\frac{1}{2}$ cents per cadet per day; the cost to each cadet for the subsistence of cadets in hospital was 0.0218 cent per day; the total cost of subsistence in both cadet mess and cadet hospital was 52$\frac{1}{2}\frac{7}{9}$ cents per cadet per day; this same cost for the fiscal year ending June 30, 1896, was 53.1 cents per cadet per day.

CADET LAUNDRY.

The following exhibits the articles laundered during the year for individuals:

Bathing suits	22	Belts, shoulder	17,359
Belts, sword	2,533	Belts, waist	17,952
Blankets	260	Collars	100,699
Comfortables	111	Cuffs (pairs)	67,075
Drawers	31,269	Fatigue coats	15
Gloves (pairs)	34,512	Handkerchiefs	64,541
Jackets, white	2,447	Pillowcases	12,853
Sheets	21,515	Shirts, white	28,219
Shirts, night	11,181	Shirts, under	31,722
Socks (pairs)	34,448	Towels	58,604
Trousers, gray	97	Trousers, white	30,140

The following exhibits the articles laundered for the cadet hospital during the year:

Bandages	12	Bedspreads	430
Blankets	2	Mattress covers	3
Napkins	2,210	Pillowcases	2,258
Sheets	3,165	Shirts, hospital	26
Tablecloths	282	Towels	4,454

The total number of articles laundered for individuals and the cadet hospital amounted to 580,417. No account is kept of mess linen laundered.

The working condition of the laundry will be made more efficient by certain improvements enumerated in my annual estimates.

Respectfully submitted.

WM. F. SPURGIN,
Captain, Twenty-first Infantry, Treasurer United States Military Academy,
Quartermaster and Commissary of Cadets.

E.

WEST POINT, N. Y., *August 30, 1897.*

The ADJUTANT UNITED STATES MILITARY ACADEMY.

SIR: In accordance with instructions I have the honor to submit the following report of the principal operations in the department of ordnance and gunnery at the United States Military Academy during the fiscal year ending June 30, 1897.

LABORATORY.

The routine work at the laboratory includes the care and preservation of two light batteries, the seacoast battery and Battery Knox, and the siege and mortar batteries. The guns and carriages belonging to these batteries have been painted, lacquered, and kept in repair during the year. The rapid-fire and machine guns have been kept in the ordnance museum, where they are exhibited and used for cadet instruction, and where they can be kept in better condition.

The routine work also includes the preparation of the ammunition for gallery practice, and necessary targets for cadet practice, and attendance upon the same; the care and repair of the implements used in mechanical maneuvers, repairs of cadet arms and equipments, and the care and preservation of the trophy guns. Two model breechblocks have been made for each of the Hotchkiss R. F. gun and mountain rifle. A model shaper one-fourth size has been made for use in cadet instruction and for exhibition in the museum.

A new floor has been laid in the east storeroom, the walls and ceiling of same calcimined, the exterior walls of carpenter, machine, and paint shops painted two coats, and a shingle roof put on tool shed. The old boathouse has been torn down and preparations are in progress for erecting a new one.

Considerable work has been done in the museum in arranging and cleaning the models and the placing of a large number of projectiles where they can be easily seen and examined by visitors.

MUSEUM.

A large glass case and stand hermetically sealed, containing the remainder of the trophy flags, has been placed in the museum. The flags and projectiles are all numbered. Work on a classified catalogue, embracing the numbers and description of each object in the museum, has been started.

SMALL ARMS, ETC., RECEIVED.

One Winchester rifle, caliber .30, model 1895.
One Winchester rifle, caliber .44, model 1873.
These are used for cadet instruction and also for exhibition in the museum.
The Ordnance Department has also furnished two revolving racks for small arms and a supply of small arms, bayonets, revolvers, swords, and pikes for decorating the museum.

MODELS.

The following models have been received during the year:
One 3.2-inch caisson and limber, one-tenth size.
One 3.6-inch field carriage, one-tenth size.
One 3.6-inch field mortar carriage, one-tenth size.
One 7-inch siege mortar carriage, one-tenth size.
One 12-inch seacoast mortar carriage, one-tenth size.
These models are exact reproductions of the service carriages, and are very useful in cadet instruction. Work is in progress on models of a 12-inch rifle carriage and of a battery wagon and forge.
When these are completed the department will have working models of all the service guns and carriages, except the 12-inch mortar and part of the field equipment, for which estimates have been submitted this year.

Very respectfully, your obedient servant,

LAWRENCE L. BRUFF,
Captain, Ordnance Department, U. S. A., Instructor Ordnance and Gunnery.

F.

WEST POINT, N. Y., *September 1, 1897.*

The ADJUTANT U. S. MILITARY ACADEMY,
West Point, N. Y.

SIR: I have the honor to submit the following report upon the different branches of work assigned to me for the year from September 1, 1896, to August 31, 1897:

PRACTICAL MILITARY ENGINEERING.

During October, 1896, and April, 1897, the classes of 1897 and 1898 were under instruction, and during July and August, 1897, the classes of 1898 and 1900.

The class of 1897 received instruction in abatis, bridge by successive pontoons, knots and lashing, fascine, hurdle, hoop-iron gabion, brush gabion, gabion revetment, sand-bag revetment, barrel revetment, wire entanglement (3 types), simple trench (one-sixth scale), simple trench (full scale), shelter trenches, various types, Russian gun pit, making palisading, planting vertical palisading, planting inclined palisading, gun platform, mortar platform, signaling (telegraphy), signaling with flag, model bridge train, use of reconnoissance instruments, mounted reconnoissance, flying trench (one-sixth scale), flying trench (full scale).

The class of 1898 received instruction in school of the boat, bridge by successive pontoons, making knots and lashing, trestle bridge on land, spar bridge (single lock), spar bridge (double lock), fascine, hurdle, hoop-iron gabion, brush gabion, gabion revetment, sand-bag revetment, barrel revetment, simple trench (one-sixth scale), simple trench (full scale), single full sap (one-sixth scale), single full sap (full scale), gun epaulement, B. L. gun (one-sixth scale and full scale), shelter trenches (various types), Russian gun pit, assembling and launching canvas pontoons, making palisading, planting vertical palisading, planting inclined palisading, gun platform, mortar platform, profiling and defilading, wire entanglement (3 types), signaling with flag, signaling with heliograph, flying trench (one-sixth scale), flying trench (full scale), double full sap (one sixth scale), double full sap (full scale).

The class of 1900 received instruction in school of the boat, making knots and lashings, assembling and launching canvas pontoons, trestle bridge on land, wire entanglement, bridge by successive pontoons, fascine revetment, gabion revetment, barrel revetment, sand-bag revetment, signaling with flag (sending and receiving).

COMPANY E, BATTALION OF ENGINEERS.

This company has furnished throughout the year a daily guard detail of from 10 to 12 men; has kept its barrack and barrack ground in repair and police; cultivated its garden; kept the two pontoon trains and the cadet boats in repair; completed one new pontoon boat, and has kept the seacoast, siege, and motar batteries, with Fort Clinton and Battery Knox, in order. It has assisted in the instruction of the cadets in practical military engineering, preparing the bridge and siege material.

In connection with the extension of the waterworks it has also furnished field parties for the surveys and construction and two noncommissioned officers as overseers of working parties. It has also furnished from two to three teachers for the post school for soldiers' children and a like number for the post school for enlisted men.

The company participated in the inaugural ceremonies at Washington, D. C., on March 4, 1897, leaving the post on March 3 and returning on March 5. It joined the battalion at Jersey City on the morning of the 3d, and was detached at the same place on the afternoon of the 5th.

On April 27, 1897, the company joined the battalion in New York City and marched in the parade at the dedication of the General Grant Monument, returning to West Point the same day. On both occasions the conduct and bearing of the men were excellent.

The company is now 5 below the allotted strength. Four desertions occurred during the year, the company in each case being the gainer.

The physical condition of the men has continued excellent and the discipline of the company good.

Attention is invited to the accompanying table (A), which contains a résumé of the company's duties by months.

WATER SUPPLY.

During the year water has been drawn for a few days at a time from Round Pond and the new reservoir, but, as in former years, the main reliance has been upon the Cascades and Cro Nest streams.

On September 23, 1896, Round Pond reached the stage of 5.5 feet, the lowest recorded since 1885. It has not since been drawn upon, and at this date the gauge reads 17.3 feet. It is desirable that this pond be not heavily drawn upon for the present, but that it be given a chance to overflow, which it has not done freely since June, 1893, the overflow of June, 1895, having been slight. The pipe line connecting the post with the Cascades stream and Round Pond has given no trouble during the year, and has required no repairs. The line of 6-inch pipe leading to Cro Nest Pond was opened near the middle of its length and a blow-off inserted.

This pipe was found so badly tuberculated that its original carrying capacity must be reduced by more than one-half. This is an unfortunate matter, for of the available streams the Cro Nest Brook furnishes the purest and clearest water, a large volume of which runs to waste every year for want of a suitable pipe or channel to carry it to the point of distribution. As soon as practicable funds should be secured for connecting this stream with the new reservoir by pipe or channel of requisite capacity.

NEW RESERVOIR.

The valves at the main dam were closed on November 19, 1896, and the following stages were recorded as the reservoir filled, the elevations being referred to the plane of mean low water:

	Feet.
November 30, 1896	299.5
December 31, 1896	305.1
January 31, 1897	308.4
February 28, 1897	313.3
March 31, 1897	320.0
April 30, 1897	322.0
May 31, 1897	324.1
June 30, 1897	324.0
July 31, 1897	324.6
August 31, 1897	324.3

The highest stage, 325 feet, was recorded on July 24. On account of the work in progress on the western swamp and spillway, it has been impracticable to allow the

reservoir to fill above 325, and the waste valve has frequently been opened to keep the water below that stage.

The stored water has steadily improved in color and transparency.

A chemical analysis made by Lieut. Palmer E. Pierce, Sixth Infantry, June, 1897, has showed a marked improvement in the quality of the water since last winter. As the reservoir has this season been filled for the first time since its completion, the water ought to have been at its worst and should improve with longer storage.

The work of the current season on the reservoir has resulted in the practical completion of the north connecting road, north dam, and the main dam except parapet walls, the overflow, and spillway, and a very important work for the preservation of the quality of water, in the filling of the swamp just west of the reservoir, thereby cutting off a very objectionable flow of dark-colored and foul-smelling water.

Work yet to be done, for which no funds are now available, includes placing parapet walls and fences where needed for safe travel along the boundary of the reservoir, removal of an area of shallow flowage on the east side of the reservoir just below the flow line (326), and taking out some soil and vegetable matter. An estimate of $10,000 has been submitted for these features of the work.

The following table, computed by Lieut. E. E. Winslow, Corps of Engineers, gives the contents of the reservoir for each foot of rise up to the flow line (326):

Contours.	United States gallons to the foot.	Aggregate United States gallons.	Contours.	United States gallons to the foot.	Aggregate United States gallons.
295	0	0	311	3,009,000	33,571,000
296	1,352,000	1,352,000	312	3,110,000	36,681,000
297	1,377,000	2,729,000	313	3,210,000	39,891,000
298	1,418,000	4,147,000	314	3,309,000	43,200,000
299	1,478,000	5,625,000	315	3,406,000	46,606,000
300	1,562,000	7,187,000	316	3,505,000	50,111,000
301	1,681,000	8,868,000	317	3,605,000	53,716,000
302	1,828,000	10,696,000	318	3,706,000	57,422,000
303	1,992,000	12,688,000	319	3,810,000	61,232,000
304	2,159,000	14,847,000	320	3,917,000	65,149,000
305	2,314,000	17,161,000	321	4,026,000	69,175,000
306	2,447,000	19,608,000	322	4,137,000	73,312,000
307	2,569,000	22,177,000	323	4,251,000	77,563,000
308	2,685,000	24,862,000	324	4,369,000	81,932,000
309	2,796,000	27,658,000	325	4,490,000	86,422,000
310	2,904,000	30,562,000	326	5,114,000	91,536,000

REMOVAL OF SOIL AND PEAT.

Under the appropriation of $7,500, for this purpose, work was continued until about November 1, 1896, when it was stopped by the exhaustion of the funds. The work done consisted in digging a deep ditch to keep the excavation free from water, providing movable plank roads, to carry the horses and vehicles, removing 15,190 cubic yards of soil and peaty matter from the low part of the reservoir basin, taking out a large number of stumps and roots, clearing brush from about 4 acres of the low area, and in spreading nearly 5,000 cubic yards of hardpan as a covering to the peaty deposit where its removal was prohibitory on account of its great cost.

The object in removing the soil and peat in question was to prevent its having a possibly deleterious action upon the water stored in the reservoir. Sufficient time has not yet elapsed to determine whether the desired result has been fully secured for all depths of the reservoir, but present indications are favorable. If the result should be unsatisfactory it will be necessary to remove the entire deposit of peat, or to increase the thickness of the hardpan covering. The former will be expensive, but certain; the latter less costly, but somewhat in the nature of an experiment.

NEW FILTER BEDS.

Under the appropriation of $25,000 for constructing a set of filter beds, the site has been cleared, the trenches for the outside walls excavated, a large quantity of stone quarried, and a portion of the walls built. The excavation has been difficult and costly, but not more so than was anticipated. The connection with the new reservoir has been completed, and contracts for building materials have been made on advantageous terms. It is expected that the masonry walls will be finished by the time freezing weather sets in.

The original estimate for this work was $40,000, but only $25,000 has been appropriated; it is probable that the total cost will be increased by $1,000 on account of the masonry having to lie over for one year in an unfinished condition. An estimate has been submitted for the amount deemed necessary to complete the work.

NEW SUPPLY MAIN.

Under the appropriation for this main contracts for material were made early last spring and promptly filled. The work of pipelaying has been pushed by the post quartermaster, and the greater part.of it is now finished.

MEMORIAL HALL.

During the year this building has slowly approached completion, much time having been lost by the failure of the contractors and in the preparation for a resumption of work by the sureties. At this date the main walls are practically finished and most of the roof trusses in place. Considerable progress has been made with the interior finish and fittings. The work done appears to be of good character.

CONCLUSION.

In conclusion, I desire to express my appreciation of the faithfulness and ability with which First Lieut. E. E. Winslow, Corps of Engineers, has performed his duties as an officer of Company E, Battalion of Engineers, as assistant instructor in the department of practical military engineering, and as assistant engineer upon the extension of the waterworks.

Very respectfully,

JAS. L. LUSK,
Captain, Corps of Engineers, Instructor of Practical Military Engineering.

(A.)

	1896.				1897.							
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.
Average strength of company	93	90	92	98	99	95	94	95	95	96	97	96
Average strength of guard detail	12	12	12	12	12	12	12	12	12	12	12	12
Fatigue days	24	23	25	24	22	22	21	23	22	24	24	24
Infantry drills	4	3	4	3	3	13	4	12	4	2	11	12
Signal drills	4	3	2	2	0	2	2	2	4	2	8	11
Engineering drills	5	3	5	3	3	4	4	1	3	5	8	9
Gymnasium drills	0	0	1	3	4	3	4	3	7	5	0	0
Average attendance at drills	38	38	40	34	36	47	46	33	33	40	42	42
Target practice, days	5	7	0	0	0	0	0	0	0	0	0	0
School days	0	0	20	22	20	20	17	0	0	0	0	0
Average attendance at school	0	0	22	25	17	19	19	0	0	0	0	0

G.

QUARTERMASTER'S OFFICE, UNITED STATES MILITARY ACADEMY,
West Point, N. Y., August 25, 1897.

The ADJUTANT UNITED STATES MILITARY ACADEMY,
West Point, N. Y.

SIR: I have the honor to submit herewith the following report of the operations of the quartermaster's department at West Point, N. Y., for the fiscal year ending June 30, 1897, prepared in accordance with instructions from your office, dated August 4, 1897:

QUARTERMASTER'S DEPARTMENT, UNITED STATES ARMY.

The duties pertaining to this department are enumerated in paragraph 972, Army Regulations, 1895.

The amounts received, disbursed, etc., under the various heads of appropriation are shown in accompanying statement, marked A.

The following contracts for furnishing fuel, forage, and straw were entered into and were satisfactorily fulfilled:

Ward & Olyphant: 600 tons egg coal, 1,100 tons stove coal, 300 tons chestnut coal.
Max Morgenstein: 200 cords hard wood.
Clark & Wilkins: 25 cords soft wood.
John F. O'Brien: 600,000 pounds oats, 40,000 pounds middlings, 40,000 pounds bran, 400 tons hay, 100 tons straw.

The increased number of draft animals allowed during the year has proved very advantageous and greatly increased the efficiency of the department. The new coal wagons have also been of great service and have proved to be most satisfactory, enabling coal to be delivered with much less work and in a manner more satisfactory to the officers.

QUARTERMASTER'S DEPARTMENT OF THE UNITED STATES MILITARY ACADEMY.

My duties in this branch are defined in paragraph 15 of the United States Military Academy Regulations, 1894.

Contracts entered into during the year and made in previous years and remaining in force in the fiscal year to which this report relates were as follows:

No.	Contractor.	Date.	Purpose.
1	Probst Construction Co	Jan. 22, 1896	Memorial Hall.
2	Westmoreland Coal Co	June 5, 1896	1,700 tons gas coal.
3	Ward & Olyphant	June 8, 1896	4,600 tons anthracite coal.
4	James Weyant	June 6, 1896	50 cords hard wood.
5	Martin S. Adams	do	1,500 bushels charcoal.
6	Wm. H. Ladue	July 31, 1896	Addition to the schoolhouse for enlisted men's children.
7	Dooley & Ayers	Mar. 16, 1897	Guardhouse.
8	Warren Foundry and Machine Co	Mar. 23, 1897	Cast-iron pipe and special casting.
9	Joseph H. Miller	May 26, 1897	Hauling.

The Probst Construction Company, the contractor for the construction of the Memorial Hall, having passed into a receivership, the contract is being completed by its bondsmen, the American Surety Company of New York. All the other contracts have been completed, or work under them is being carried on in a satisfactory manner.

The following buildings have been repaired, etc.:

Cadet mess building, cadet quartermaster's building, gymnasium, cadet guardhouse, cadet barracks, cadet hospital, soldiers' hospital, band barracks, cadet sinks, quartermaster's stables and barn, Company E, engineer's barracks, engineer equipment shed, ordnance laboratory, cavalry stables, hospital stewards' quarters, and cavalry barracks.

An additional appropriation for the construction of a guardhouse at south gate having been obtained for the fiscal year 1898, making a sufficient amount available, a contract has been made for its construction. Work is progressing, and the building should be completed by October 1.

The repair and improvement of the Army service detachment barracks has been completed, making in its improved condition a very satisfactory barracks.

The appropriation, $2,000, for the repair of the south dock was so entirely insufficient that it was not deemed advisable to commence the work of reconstructing the dock, as it could not be accomplished with the amount appropriated. The money was expended in making temporary repairs absolutely necessary to make the dock safe for use this season, and in the purchase of materials which will be used for rebuilding the dock when additional appropriation is made. The repair of this dock is imperative, as in its present condition it is extremely dangerous. The request of an additional appropriation of $22,000 for the fiscal year 1898 is recommended.

The rebuilding of the ordnance boathouse is now in progress.

The latrine at cadet camp has been enlarged to about twice its original size and equipped with modern and sanitary plumbing throughout.

No satisfactory proposal being received for the construction of the public latrine, it is now being constructed by day labor.

The stone wall at the cemetery is being rebuilt, and the wrought-iron gates formerly used at the south gate have been repaired and set up at the new entrance to the cemetery.

The stone wall, for about 1,000 feet on the east side of the road from the crossroads to Highland Falls, has been rebuilt.

Granolithic pavement was laid from the main walk to the bachelors' quarters.

Attention is again invited to the method of paying the permanent civilian employees adopted July 1, 1896. The duty of paying the additional pay to officers, the extra-duty pay to enlisted men, and the pay of civilians provided for by the act making appropriations for the support of the Military Academy, was then transferred to the pay department. The transfer of the first two appears desirable, as it relieves this office of the necessary clerical work of preparing the rolls and vouchers and does not materially increase the clerical work of the companies, requiring only the additional note on the muster and pay rolls to cover the payment of the extra-duty pay.

The transfer of the payment of the civilian employees is not, in my opinion, advisable, as it unnecessarily increases the work both of this office and that of the paymaster designated to make the payment without any corresponding advantage. Prior to the change all the regular civilian employees were paid on the monthly rolls, with those temporarily hired, such as painters, carpenters, and mechanics of all kinds, as well as the laborers. The money was drawn from the Treasury at the same time and one pay day answered for all, the 27 permanent employees entailing very little additional work in paying several hundred men. Under the present arrangement rolls (in triplicate) must be prepared by this office and the signatures thereon be obtained as before. These rolls are forwarded by the superintendent to the paymaster, who is obliged under the regulations to put each man's pay in a separate envelope, marking the envelope with the man's name and its contents, etc., and then forward same to the superintendent. He transmits the package to the disbursing officer, who distributes the envelopes to the employees, seeing that each envelope is correct.

This system, it will be seen, makes the work performed by the pay department entirely additional and unnecessary and at the same time increasing the work of this office.

I would recommend that the matter be brought to the attention of the adjutant general, with a view of having the civilian employees paid, as heretofore, by this office.

Statement of the receipts and disbursements for the fiscal year ending June 30, 1897, accompanies this report, marked B.

GAS WORKS, UNITED STATES MILITARY ACADEMY.

As director of the gas works I am charged with providing the necessary illuminating gas for the needs of the post. In order to properly light the buildings and grounds of the Academy, Congress appropriated for the current fiscal year the sum of $6,500 for the purchase of gas coal, oil, candles, lanterns, matches, chimneys, and wicking for lighting the Academy chapel, library, cadet barracks, mess hall, shops, hospital, offices, stables, and riding hall, sidewalks, camp, and wharves. As the gas consumed costs more than the amount appropriated, all that which is consumed at places not enumerated in the act is sold at actual cost of manufacture with a small increase for contingencies, which includes a portion of the deficiency above named and also provides for contingent repairs, which experience has shown to be necessary from time to time. The remainder of the deficiency is charged to cadets, who pay for gas at the rate of 35 cents per month for the time they are actually present. The sale of gas as above, of coke, coal tar, etc., constitutes a fund known as the "contingent fund," which is expended under the direction of the Superintendent of the Academy in the purchase of additional gas coal when necessary, retorts, gas fixtures and repairs of same, pay of labor employed in making gas, and such other expenditures as pertain to the gas-making plant of the Academy.

The following statement shows the increase in the amount of gas manufactured in the last three years, and the coal consumed. The amount appropriated for the purchase of gas coal, oil, etc., for the fiscal year 1898 has been increased from $5,000 to $6,500, and it is hoped that this will be sufficient to cover the purchase of the coal and oil required.

Gas manufactured from July 1, 1894, to June 30, 1895, inclusive	feet..	14,264,800
Coal used from July 1, 1894, to June 30, 1895, inclusive	pounds..	3,503,300
Gas manufactured from July 1, 1896, to June 30, 1897, inclusive	feet..	15,859,600
Coal used from July 1, 1896, to June 30, 1897, inclusive	pounds..	3,902,700

The receipts and disbursements are shown in the statement of the contingent fund herewith, marked C.

SPECIAL CONTINGENT FUND, UNITED STATES MILITARY ACADEMY.

This fund is derived from the rent of certain buildings on the post and from the sales of gas, coke, coal tar, etc.

Statement of the receipts and disbursements under this head accompanies this report, and is marked C.

Respectfully submitted.

J. B. BELLINGER,
Captain and Assistant Quartermaster, United States Army,
Disbursing Officer United States Military Academy.

A.—*Statement of funds pertaining to the Quartermaster's Department, United States Army, for the fiscal year ending June 30, 1897.*

Balance on hand July 1, 1896	$1,299.45
Received since:	
Regular supplies	24,892.11
Incidental expenses	11,035.08
Army transportation	6,227.64
Sales to officers	4,127.00
Sales at auction	202.25
Total to be accounted for	47,783.53
Disbursed:	
Regular supplies	25,079.25
Incidental expenses	11,069.29
Army transportation	6,227.24
Deposited	4,387.05
Balance on hand June 30, 1897	1,020.70
Total	47,783.53

B.—*Statement showing receipts and disbursements, etc., of funds pertaining to the appropriations for the support of the United States Military Academy, for the fiscal year ending June 30, 1897.*

Date.		Current and ordinary expenses.	Miscellaneous and incidental expenses.	Buildings and grounds.	Memorial Hall.	Total.
	CR.					
	Balance on hand, fiscal year—					
July 1, 1896	1895			$2,969.32		$2,969.32
Do	1896	$16,395.45	$3,778.21	3,282.75		23,456.41
Do	Memorial Hall				$31,633.25	31,633.25
	Received since fiscal year—					
June 30, 1897	1894	25.20				25.20
Do	1896	25.20		40.00		65.20
Do	1897	60,050.00	15,000.00	35,000.00		110,050.00
Do	1897-98			25,000.00		25,000.00
Do	Memorial Hall				100,000.00	100,000.00
	Total	76,495.85	18,778.21	66,292.07	131,633.25	293,199.38
	DR.					
	Disbursed, fiscal year—					
June 30, 1897	1895			1,889.06		1,889.06
Do	1896	11,038.22	3,344.20	2,580.74		16,963.16
Do	1897	55,836.60	13,835.33	32,312.20		101,984.13
Do	1897-98			14,999.52		14,999.52
Do	Memorial Hall				99,442.84	99,442.84
	Deposited, fiscal year—					
Do	1894	25.20				25.20
Do	1895			1,080.26		1,080.26
Do	1896	1,706.81				1,706.81
	Balance on hand, fiscal year—					
Do	1896	3,675.62	434.01	742.01		4,851.64
Do	1897	4,213.40	1,164.67	2,687.80		8,065.87
Do	1897-98			10,000.48		10,000.48
Do	Memorial Hall				32,190.41	32,190.41
	Total	76,495.85	18,778.21	66,292.07	131,633.25	293,199.38

C.—*Statement of receipts and expenditures pertaining to the special contingent fund United States Military Academy, from July 1, 1896, to June 30, 1897.*

	Gas works.	Rents, etc.	Total.
Balance on hand July 1, 1896	$905.99	$519.53	$1,425.52
Received since:			
By rent of—			
West Point Hotel	.....	1,750.00	
Post-office	.....	175.00	
Stables	.....	75.00	
Store (retiring house)	.....	350.00	
By sale of—			
Gas	5,124.68	.....	
Coke	694.53	.....	
Coal tar	440.00	.....	
Junk	.....	27.43	
Miscellaneous	.....	140.00	
	6,529.21	2,517.43	8,776.64
Total to be accounted for	.....	.....	10,202.16
Disbursed	6,427.15	2,951.29	9,378.44
On hand June 30, 1897	.....	.....	823.72
Total accounted for	.....	.....	10,202.16

SIXTH REPORT OF THE BOARD OF ORDNANCE AND FORTIFICATION.

REPORT OF THE BOARD OF ORDNANCE AND FORTIFICATION.

WAR DEPARTMENT,
Washington, D. C., October 31, 1897.

The SECRETARY OF WAR.

SIR: In compliance with the provisions of the act approved February 24, 1891, the Board of Ordnance and Fortification has the honor to submit for transmission to Congress its annual report for the year ending October 31, 1897, as follows:

NEW LEGISLATION AFFECTING THE BOARD.

The only new legislation affecting the Board was contained in the fortification act, approved March 3, 1897, which made an appropriation for the work of the Board during the year ending June 30, 1898, as follows:

Board of Ordnance and Fortification.—To enable the board to make all needful and proper purchases, experiments, and tests to ascertain, with a view to their utilization by the Government, the most effective guns, small arms, cartridges, projectiles, fuses, explosives, torpedoes, armor plates, and other implements and engines of war, and to purchase or cause to be manufactured, under authority of the Secretary of War, such guns, carriages, armor plates, and other war material as may, in the judgment of the board, be necessary in the proper discharge of the duty devolved upon it by the act approved September twenty-second, eighteen hundred and eighty-eight; to pay the salary of the civilian member of the Board of Ordnance and Fortification provided by the act of February twenty-fourth, eighteen hundred and ninety-one, and for the necessary traveling expenses of said member when traveling on duty as contemplated in said act; for the payment of the necessary expenses of the board, including a per diem allowance to each officer detailed to serve thereon when employed on duty away from his permanent station, of two dollars and fifty cents a day; and for the test of experimental guns, carriages, and other devices procured in accordance with the recommendation of the Board of Ordnance and Fortification, one hundred and fifty thousand dollars: *Provided*, That before any money shall be expended in the construction or test of any gun, gun carriage, ammunition, or implements under the supervision of the said board, the board shall be satisfied, after due inquiry, that the Government of the United States has a lawful right to use the inventions involved in the construction of such gun, gun carriage, ammunition, or implements, or that the construction or test is made at the request of a person either having such lawful right or authorized to convey the same to the Government.

That all material purchased under the foregoing provisions of this act shall be of American manufacture, except in cases when, in the judgment of the Secretary of War, it is to the manifest interest of the United States to make purchases in limited quantities abroad, which material shall be admitted free of duty.

APPROPRIATIONS AND ALLOTMENTS.

In compliance with the act of February 24, 1891, which requires the Board to "give a detailed statement of all contracts, allotments, and expenditures made by the board," an exhibit, marked Appendix A, is attached to this report, giving this detailed statement from October 31, 1896, to October 31, 1897.

No contracts are entered into by the Board, as they are made by the chief of the department to which the work pertains, under the direction of the Secretary of War.

The following table gives a summary of the balances of appropriations at the date of the last report, the appropriations and allotments made during the year, and the balances remaining on hand October 31, 1897:

Summary of balances, appropriations, and allotments of the Board of Ordnance and Fortification for the year ended October 31, 1897.

Act.	Balance on hand Oct. 31, 1896, and appropriated during the year.	Net allotments during the year.	Balance on hand available for allotment.
Fortification act of Sept. 22, 1888	$5,392.60	.....	$5,392.60
Fortification act of—			
Mar. 2, 1889	14,775.00	.....	14,775.00
Aug. 18, 1890	15,355.69	$5,050.00	10,305.69
July 25, 1892; Feb. 18, 1893; Aug. 1, 1894; Mar. 2, 1895; and June 6, 1896	152,354.92	179,106.44	123,248.48
Mar. 3, 1897	150,000.00		
Total	337,878.21	184,156.44	153,721.77

GENERAL OPERATIONS.

The general operations of the Board during the year have comprised the consideration of a great many suggestions and plans for seacoast defense, and the examination of devices and machines pertaining thereto; the perfecting of a system of fire control for seacoast forts, including the equipment of a typical artillery station at Fort Wadsworth; the test of experimental guns and carriages; the investigation of the penetration of shot into a concrete parapet and its sand covering, and the development of a suitable high explosive for charging shells.

Many suggestions are received from persons unfamiliar with the requirements of modern artillery practice and fortress armament, which are often absurd or have already been tried and discarded, so that the number of rejected plans far exceeds those recommended for trial. All projects have, however, been carefully considered, and no plan has been rejected without good and sufficient reason.

SUBJECTS CONSIDERED.

The following list for the year shows the variety of subjects that come before the Board at its monthly meetings. The action of the Board in each case is briefly stated:

Subjects considered by the Board during the past year.

Subject.	Proposed by—	Action.
Disappearing carriage	Lieut. Col. S. M. Mansfield	Not recommended.
Road level, Batson-Sawtelle	Lieut. C. G. Sawtelle, jr.	Allotment.
Relocator, Rafferty	American Artillery Range Finder and Relocator Co.	Do.
Wire-wound gun, 10-inch	Brown & Munsell, trustees	Do.
Photo chronograph, polarizing	Lieut. Geo. O. Squier	Do.
Range finder, emergency	Board to Test Range Finders	Do.
Typical artillery station	Board of Ordnance and Fortification.	Do.
Azimuth and range indicator	Lieut. S. E. Allen	Do.
Rapid-fire gun, 6-inch	Board of Ordnance and Fortification.	Do.

Subjects considered by the Board during the past year—Continued.

Subject.	Proposed by—	Action.
Armored car	John Delaney	Not recommended.
Torpedo	J. N. H. Patrick	Action postponed.
Harbor defense	Ava R. Coleman	Not recommended.
Gun	Alfonse Mercer	Do.
Emergency defense, by barbed wire	M. L. Jameson	Do.
Range finder, alternating current	Lieut. Geo. O. Squier and Prof. A. C. Crehore.	Allotment.
Emergency defense, by steel rails	Board of Ordnance and Fortification.	Committee report.
Multiplying scale	Lieut. W. C. Rafferty	Tested and not recommended.
Searchlight, test of	Board of Ordnance and Fortification.	Allotment.
High explosive, "Infernite"	James H. Morgan	Not recommended.
Pneumatic gun	D. M. Mefford	Do.
High explosives, gun for propelling	Maxim Powder and Torpedo Co.	Do.
High explosive	George Blackman	Awaiting further information.
Range finder, emergency	American Artillery Range Finder and Relocator Co.	Allotment.
Telescopic bore sight	Board on Regulation of Seacoast Artillery Fire.	Do.
Telotypes	Joseph Sheehy	Ordered.
Disappearing carriage, new design	Capt. W. B. Gordon	Action postponed.
Dispatch bomb	H. B. Littlepage	Not recommended.
Revolving turret	George D. Noble	Do.
Small arms	W. H. Hammond & Co	Do.
High explosives, firing	Byron Rice	Do.
Steam cannon	J. W. Davis	Do.
"Magnetic torpedo," Criticisms on a	Joseph Sax	Filed.
"Dispatch locks," etc	F. H. Bullis	Not recommended.
Telescopic sight	Stackpole & Bro	Allotment.
Pneumatic dynamite gun	Pneumatic Torpedo and Construction Co.	Adopted for certain positions.
Replotter arm	Lieut. I. N. Lewis	To be tested.
Visual target indicator	Lieut. Arthur Murray	Constructed under allotment.
High explosives, firing	H. W. Blair	Awaiting further information.
Hinged shield	Edward S. Holden	Filed.
Invention, undeveloped	A. L. Newton	Not recommended.
Defense by cables	Charles Lachenmaier	Do.
Projectile	W. H. Weddington	Do.
Range finder	Ava R. Coleman	Do.
Torpedoes, apparatus for operating	W. F. Brewster	Papers filed.
Machine gun, 37 mm	Maxim-Nordenfelt Guns and Ammunition Co.	Not recommended.
Fire direction, system of	George Stacy	Do.
Range Finder Board, personnel of	Secretary of War	Recommendation made.
Haskell 8-inch gun, expense of test	Chief of Ordnance	Allotment.
Ferris wheel, weight, cost, etc., information as to,	L. V. Rice	Filed.
"Pantelemeter"	E. Cuenod for Col. C. de Charriere.	Not recommended.
Experimental parapet	Board of Ordnance and Fortification.	Allotments.
Relocator	Lieut. C. L. Phillips	Not recommended.
Range finders, Lewis and Rafferty	Board of Ordnance and Fortification.	Competitive tests ordered.
Searchlights, offer to loan	General Electric Co	Accepted.
Bomb-dropping device	Capt. Geo. C. Short and Lieutenant Roach.	Not recommended.
Multicharge gun	Haskell Multicharge Gun and Projectile Co.	Do.
Bombshell	F. J. Frandolig	Do.
Electric cannon	Thomas F. Brown	Do.
Mounting mortars, method of	Wm. M. Douglas	Do.
Air ship	Millis Knickerbocker	Do.
Bomb-dropping device	Joshua Bagnall	Do.
Range finder	Wm. M. Freeman	Do.
Shell	John A. Smith	Do.
Range finder, Weldon, tests of	Army officers	Not conclusive.
Range finders, memorandum regarding	Lieut. J. R. Williams	Filed.
Electro-telephotoscope	Dr. Lacavalerie and Lieut. G. N. Whistler.	Action postponed.
Vernier	Lieut. I. N. Lewis	To be tested.
Synchronograph, report on	Lieut. Geo. O. Squier and Prof. A. C. Crehore.	Referred to Postmaster-General.
Sketching board	Lieut. James A. Moss	Not in province of board.
Elevation indicator	Lieut. W. C. Rafferty	Not recommended.
Megaphone, value of	Maj. C. A. Woodruff	Do.
Powder-pneumatic guns	Sims-Dudley Defense Co	Action postponed.
Disappearing carriage	W. T. Pool	Not recommended.
Coast defense	John Kavanagh	Do.
High explosives, device for throwing	C. H. Kirkpatrick	Do.
Double-blade projectile	E. France	Do.

Subjects considered by the Board during the past year—Continued.

Subject.	Proposed by—	Action.
Field carriage for 75-mm. gun	Chief of Ordnance	Allotment.
High explosive, "Ammonite"	Harry Allen	Not recommended.
Auto-mobile torpedo	John L. Lay	Action postponed.
Range finder, Stroobants	Board of Ordnance and Fortification.	Allotment.
Telephones for Fort Wadsworth	Board on Regulation of Seacoast Artillery Fire.	To be procured.
Range finder, logarithmic	Tokiwa Matsuo	Not recommended.
Sighting guns, method of	John G. Roberts	Do.
Range finder, micrometer	Capt. D. D. Gaillard	Referred to Board on Regulation of Seacoast Artillery Fire.
Fighting machine	Adolph J. Johnson	Not recommended.
Projectile	B. H. Veeder	Do.
Torpedo defense	Wm. F. Brewster	Do.
Cast steel 8-inch gun, casing for	R. J. Gatling	Referred to act of Congress.
Projectiles, interior loading of	Col. J. Perisse	Not recommended.
Subscale, Lewis, report on	Board of artillery officers	Adopted as type.
National defense, "Thoughts on"	George Cashel	Impracticable.
Harbor defense	J. A. Bower	Not recommended.
Gordon 10-inch carriage, modified	Morgan Engineering Co	Accepted, but not recommended as a type.
Launch, procuring from Quartermaster's Department.	Board on the Regulation of Seacoast Artillery Fire.	Allotment.
Smokeless powder	Chief of Ordnance	Change in allotment.
Defense against "lightning hurler"	Joseph Sax	Not recommended.
Burning projectile	F. L. Tripp	Do.
3-inch r. f. gun and mounts	Chief of Ordnance	Allotment.
Torpedo controller	Henry Hess	Not recommended.
Shell for high explosives	C. A. Amundson	Do.
Under-sea battery	F. Rossi	Do.
Assembling small caliber guns	Channing Burnz	Do.
Air ship	Andrew Johnson	Do.
Depression range finder, new design	American Artillery Range Finder and Relocator Co.	Allotment.
Converting instrument	Tokiwa Matsuo	Referred to Board on Regulation of Seacoast Artillery Fire.
Brown wire gun, change in breech mechanism and form of segments.	Brown & Munsell, trustees	Approved.
Tactics for seacoast artillery	Board on Regulation of Seacoast Artillery Fire.	To be tried.
Bursting time of fuses, apparatus for ascertaining.	Chief of Ordnance	Allotment.
Rapid-fire field guns and carriages	Board of Ordnance and Fortification.	Do.
Experimental parapet of steel rails	.....do	Do.

EXPERIMENTAL GUNS.

The 8-inch Haskell multicharge gun.—The test of this gun was completed in February, 1897. Only two rounds were fired. At the second round the metal between the forward pocket and the bore was found to have been crushed in, and the gun was consequently unserviceable.

This gun differs materially from the 6-inch multicharge gun which was tried in 1884. It is made of forged steel on the built-up system of construction and consists of five principal parts, viz, the breech and chase sections, the two pocket sections, and a section connecting the pocket forgings. The parts are screwed together. The bore is 50 calibers long. The pockets extend annularly about the gun and each communicates with the bore through three openings. The orifices through which the pockets are charged are closed by separate plugs made on the interrupted screw principle. The main charge and projectile are inserted in the breech section as in service guns.

The full charges for the gun are, breech, 105 pounds W. C. powder; first pocket, 116 pounds V. M., and second pocket, 122 pounds spherohexagonal. The projectile was 6 calibers long and weighed about 400 pounds.

In the first round that was fired charges of only 50 pounds of powder in the breech and each pocket were used, and in the second 75 pounds. The powder was of different degrees of quickness, that in the forward pocket being the quickest and that in the breech chamber the slowest.

The theory of the Haskell Gun Company is that the gas check at the base of the projectile failed to act perfectly and that the injury to the gun was due to the premature explosion of the powder charge in the pocket. This is probably correct.

The Board, however, declined to recommend any further expenditure of Government funds for the repair of the gun or for further experimentation with the multicharge system.

A test of the multicharge system was authorized by Congress in 1888, and since that time smokeless powders have been so developed that the advantages of such a gun, even though it equaled in every respect the expectations of its inventor, have to a great extent disappeared. It was anticipated that great muzzle velocity with low and sustained pressures would be obtained, but with modern smokeless powders the same result is attained without the complicated and uncertain mechanism which characterizes the multicharge gun.

The idea of a gun by means of which successive impulses are given to the projectile until an initial velocity approximating to the velocity of powder gases is attained is very fascinating and seems to offer wonderful possibilities, but the failure of two guns indicates that further experiment in this field would be futile. Even if extraordinary results had been obtained, there would still remain grave objections to the gun as a service weapon on account of its great length and irregular contour, the fact that it requires several grades of powder for the same round, and its slowness of loading as compared with an ordinary breech-loading rifle.

The 8-inch Gatling cast-steel gun.—This gun is now under construction, having been contracted for by the Honorable Secretary of War by virtue of the act approved June 6, 1896.

The 10-inch Brown segmental-tube wire-wound gun.—The Board in its report for 1895 stated that in case the 5-inch Brown gun did not develop any radical defect in the system it was its intention to allot money for the construction of a 10-inch gun.

The 5-inch gun failed at the one hundred and ninety-second round, but it endured some enormous pressures and its failure was not conclusive as to the merits of the system. It was also believed that Congress desired that the gun should have a thorough test. For these reasons the Board decided to recommend the allotment of $33,000 for the construction of a 10-inch rifle, and the recommendation was approved by the Secretary of War.

The Trustees of the gun report that the mill for hot rolling the segments and the machine for winding the wire on the gun with the requisite initial tension are completed and that the wire and steel for the segments have been made. The lining tube is under construction by the Bethlehem Iron Company.

The Trustees expect to have the gun ready for test about July 1, 1898.

CONTRACT GUNS.

The hundred-gun contract.—Under this contract twenty-five 8-inch, fifty 10-inch, and twenty-five 12-inch guns are to be made by the

Bethlehem Iron Company. The progress on this contract is shown by the report of the company, dated October 8, 1897:

MACHINE TOOLS AND EQUIPMENTS.

Several additions have been made to the assembling plant during the past year, including one 48-inch lathe, one 24-inch slotter, and two milling machines.

PRESENT CONDITION OF GUNS BEING MANUFACTURED UNDER THIS CONTRACT.

Twenty-five guns, 8-inch caliber.

Guns Nos. 1 to 25, inclusive.—Shipped.

Fifty guns, 10-inch caliber.

Guns Nos. 26 to 40, inclusive.—Shipped.
Gun No. 41.—Accepted and ready for shipment; in use in shop for gun-carriage tests.
Guns Nos. 42 to 50, inclusive.—Assembled.
Gun No. 51.—C hoops assembled; all other parts machined ready for assembling.
Breech mechanisms for guns Nos. 42 to 51, inclusive.—Nearly completed; breech plates not all drilled and tray latch not yet fitted.
Guns Nos. 52 to 57, inclusive.—Of the 66 forgings (exclusive of those for breech mechanisms) required for these guns, 6 jackets and 24 hoops are machined ready for assembling. All of the remaining forgings, excepting 16 hoops, are forged and rough machined, of which 6 tubes, 3 hoops, and 6 trunnions are accepted as to physical qualities.
Guns Nos. 58 and 59.—Tubes, jackets, and trunnion hoops forged, rough machined, and accepted as to physical qualities.
Guns Nos. 60 to 62, inclusive.—Tubes and trunnions forged, rough machined, and accepted as to physical qualities; jackets forged and rough machined.
Guns Nos. 63 to 73, inclusive.—Seven trunnion hoops forged, rough machined, and accepted as to physical qualities; 1 tube, 4 jackets, and 4 trunnion hoops forged and rough machined.

Twenty-five guns, 12-inch caliber.

Guns Nos. 76, 77, 79, and 80.—Assembled.
Gun No. 78.—Jacket, C1 and C2 hoops assembled; all other parts ready for assembling.
Gun No. 81.—Jacket, A1, A2, A3, C1, C2, and D hoops assembled. B2 and B3 hoops ready for assembling. Trunnion hoop forged and accepted.
Gun No. 82.—Jacket, C1, C2, and D hoops assembled. A1, A2, A3, B2, and B3 hoops ready for assembling. Trunnion hoop forged and accepted.
Guns Nos. 83 to 86, inclusive.—Of the 44 forgings (exclusive of those for breech mechanisms) required for these guns 24 hoops are machined ready for assembling and 2 C1 hoops and 2 trunnion hoops are forged, rough machined, and accepted as to physical qualities.
Mechanisms for guns Nos. 76 to 86, inclusive.—About one-half completed.

From the above it will be seen that the company is making excellent progress. It is probable that the 100 guns will be delivered considerably in advance of the contract time.

HEAVY RAPID-FIRE GUNS.

The Seabury 4.72-inch gun.—The purchase of this gun is conditional upon its fulfilling certain tests. It failed to operate satisfactorily at its trial and was removed from the Proving Ground for alteration. The breech mechanism has been radically changed, and it is understood that it will soon be returned to the Proving Ground for further test.

The Gerdom 4.72-inch gun.—The Gerdom breech mechanism was fitted to the barrel of the Hotchkiss gun the breech of which gave way about two years ago at the Proving Ground. The gun stood the prescribed

tests very satisfactorily. For full particulars of the trial reference is made to the Report of the Chief of Ordnance for the current year.

The breech mechanism had been made so as to also fit the 5-inch rapid-fire gun which is being constructed on the plan of Captain Hobbs from a single forging.

Five-inch rapid-fire gun, single forging.—This gun is not yet finished, but the tests so far taken verify the theory of its construction. The gun is made from a single forging and bored out. It is then annealed by cooling from the interior, by which treatment the proper initial strains in the metal are secured.

The 5-inch type rapid-fire gun.—This gun, for which the Board made an allotment March 12, 1896, is about completed. It is a built-up gun and is fitted with the Driggs-Schroeder breech mechanism.

The 6-inch rapid-fire gun.—This gun was proposed by the Board to take the place of 8-inch rifles in the defense of certain harbors which have not sufficient depth of water to admit armored vessels and for auxiliary use against unarmored ships, torpedo cruisers, etc.

At the request of the Board the Chief of Ordnance submitted a design for such a gun and an allotment was made for its construction July 13, 1897. The forgings for the gun have been ordered and it will be constructed as soon as possible.

Three-inch 16-pounder rapid-fire gun.—The advisability of providing a rapid-fire gun intermediate in caliber between the 6-pounder and the 5-inch rapid-fire guns for sweeping mine fields has for some time been under consideration by the Board, and at the September meeting an allotment was made to enable the Chief of Ordnance to procure and test a 3-inch gun for this purpose.

MOUNTS FOR RAPID-FIRE GUNS.

Mounts of four different types are under construction under allotments of the Board. For the 5-inch type gun, as described in the last report, a slight modification of the pillar mount is to be used. For the 6-inch, the Chief of Ordnance proposed two mounts, a disappearing carriage of the Crozier-Buffington system and a pillar mount similar to that for the 5-inch, with a preference in favor of the former. As the pillar-mount system will be thoroughly tested with the 5-inch gun, the Board decided to test the Crozier-Buffington with the 6-inch.

If sufficient rapidity of fire can be obtained with this design its advantages are obvious. The pillar mount, though under cover of the parapet when not firing, is necessarily exposed in action. The gun detachment is somewhat protected by the gun shield, but this is, of course, inadequate against large-caliber guns. With the disappearing system the gun is only above the parapet at the instant of firing and the gun detachment is completely protected, with the exception of the gun layer, whose head only is exposed in sighting. The sight is placed upon the carriage instead of upon the gun, and the gun can be laid while being loaded. It remains to be seen, when the two types are tested, whether or not the pillar mount will show any marked superiority in rapidity of aimed fire.

Mounts for 3-inch rapid-fire guns.—Two types of mount have been ordered, at the suggestion of the Chief of Ordnance, for the 3-inch gun, one for use behind parapets and the other in casemates. The parapet mount is constructed to be raised above the parapet like the pillar mount, but this is accomplished in a different way. The casemate mount is designed for use through embrasures and is similar to the

parapet mount without the disappearing feature. Both mounts have hydraulic cylinders to check the recoil.

It is hoped that within another year the whole subject of rapid-fire guns and their mounts will be definitely settled.

RAPID-FIRE FIELD GUNS.

At the date of the last report, four rapid-fire field guns were undergoing test under allotments made by the Board—the Seabury, Dashiell, Fletcher, and Gerdom. The last named was found by the Ordnance Board to have passed the tests in the most satisfactory manner. The gun was afterwards fired for endurance, and at the nine hundred and twenty-fifth round gave way at the breech under peculiar circumstances.

It is customary at the Proving Ground to combine, in the interests of economy, as many different objects in the tests as possible, and at the time of the explosion an aluminum cartridge case with a piston-like head was being experimented with.

The case sheered off just forward of the head, permitting the gas to escape into the breech recess through the annular opening thus formed. There was therefore practically no obturation, and the walls of the breech recess received the whole force of the gas pressure and consequently gave way. The walls of the jacket in which the breech recess is cut in this gun are not designed to resist such a pressure, which must have been nearly as great as that in the powder chamber. The Ordnance Board did not believe that the bursting would have occurred with a normal gun and cartridge case, and expressed the opinion that the failure of this gun should not cause the condemnation of the Gerdom system of breech mechanism.

The Gerdom breech mechanism is equally well adapted to the use of both metallic and nonmetallic ammunition, and it will be possible at any time to make the change to a rapid-fire system without great expense.

The advantage of a rapid-fire breech mechanism in field guns depends largely upon the carriage, as with our present carriage more time is required to run the gun into battery than to load. It is claimed that certain foreign carriages, such as the Canet and Darmencier, are not materially disturbed by firing, and the correction of small lateral deviations is provided for in the mounting of the gun on the carriage. An allotment has been made for the procurement of one of these carriages for test.

GUN CARRIAGES.

Emery 12-inch elevating carriage.—The following report of Mr. A. H. Emery shows the progress made in the construction of this carriage:

STAMFORD, CONN., *October 6, 1897.*

BOARD OF ORDNANCE AND FORTIFICATION,
War Department, Washington, D. C.

GENTLEMEN: In reply to yours of September 27th, requesting report of progress on the construction of my 12-inch elevating gun carriage, I have to say that all the principal forgings and castings have been ordered and a large portion of them delivered.

Most of the smaller work, with the exception of the springs, has also been ordered.

I have had much difficulty in placing the machining of this work, owing to several reasons. One is that few shops could machine the large pieces, and of these the two where I had hoped to have had this work principally done could not take the work because of large time contracts which they have taken for other gun carriages. The few other shops which could do this work, with one exception, declined, not because I was unwilling to pay a good price for the work, but of their hope that

business would improve, as it has done, when they did not wish to have so large a machine taking up shop room for such a length of time as this carriage necessitated.

Work has been done in several shops, but the main part of finishing all of the large and most of the small parts (springs excepted) of this work was finally contracted for with a suitable party, who is doing the work, where it is progressing well, though not as fast as I had hoped.

I have delayed putting in the foundations, as I needed the time to care for the many parts of the carriage, made of many pieces, and scattered, as it has been, in several shops.

I now hope to put in the foundations early in the spring and then to proceed promptly with the erection of the whole carriage and have it up and fully tested during the summer of 1898.

I have already provided all the powder and projectiles for the preliminary and proof tests, and the projectiles for the preliminary and the powder and projectiles for the proof tests have already been delivered, so that there need be no delay waiting for ammunition when the carriage is ready to test.

Very respectfully,

A. H. EMERY.

The second 10-inch pneumatic carriage.—This carriage is finished, has been mounted at the Proving Ground, and will be tested shortly.

The 10-inch Howell counterpoise carriage.—This carriage is completed with the exception of the assembling and adjustment of parts. It is expected that it will be ready for the shop trial in about three months, and it will then be sent to the Proving Ground for the ballistic tests.

The modified Gordon 10-inch carriage.—This carriage has successfully passed its test, but was not considered superior to the adopted carriage and therefore not recommended as a type.

The carriage is much improved by the alterations, as the pneumatic feature by which it was returned to battery by air compressed by the recoil has been replaced by overcounterweighting, and it has been changed from a nonrecoil mount to one in which the acceleration is gradually given to the counterweights without introducing the enormous overturning moment which existed in the original carriage. The carriage is, however, extremely bulky, the hauling-down apparatus is very slow, and it is more expensive than the service model. The carriage at the Proving Ground is serviceable and could be used if considered desirable. It has the advantage of an all-around fire over any other disappearing carriage thus far tested, and has a greater cover—13 degrees.

The 12-inch disappearing carriage.—The test of this carriage is nearly completed and it has proved an unqualified success. The development of this carriage is considered by the Board as a decided advance, as it enables the Government to mount its heaviest guns under cover, without resorting to such expensive devices as the gun-lift battery and armored turrets, which were considered the only solution of the problem a few years ago.

The inventors and designers of this carriage, Col. A. R. Buffington and Capt. William Crozier, of the Ordnance Department, are to be congratulated upon this successful culmination of their system.

All-around fire 10-inch Buffington-Crozier carriage.—The detailed drawings for this carriage have been completed, and it is expected that a type carriage will be ready for test before the end of the fiscal year.

SMOKELESS POWDERS.

The development of satisfactory smokeless powders for cannon has been under the immediate supervision of Capt. Sidney E. Stuart, of the Ordnance Department, and allotments have been made by this Board from time to time to carry on the work. A very considerable

advance has been made during the past year. In order to put the manufacture on a practical basis, contracts were made with the leading powder makers to supply powder of a composition specified by the Ordnance Department, but leaving the form of grain to the manufacturer. This has resulted in the production of several forms of grain, all giving an increase of at least 25 per cent of energy, when fired, over the brown cocoa powder previously employed. These powders are now being delivered, and though the tests have not been completed, they have proceeded sufficiently far to settle definitely the composition and to indicate that the selection of the form of grain is a matter of the near future.

The powder that will be selected may be stated to be, without divulging the exact formula, a compound of nitro-glycerine and gun cotton in such proportions and with such a character of gun cotton as to prevent undue erosion of the bore and still give high ballistic results.

It may be asserted that orders could now be given for smokeless powder and a form of grain specified for all guns in the service that would leave little to be desired as to ballistic results. Further experiments will however be made, and they will be directed to the adjustment of the grain to each particular gun, so as to obtain the best ballistics without undue expenditure of powder.

SPECIAL METHODS OF THROWING HIGH EXPLOSIVES.

In the last annual report five systems were under consideration, viz: The Sims-Dudley; that of the Maxim Powder and Torpedo Company; that of the Pneumatic Torpedo and Construction Company; the Mefford, and the Justin.

These rival systems were carefully investigated by committees of the Board, and, in accordance with their reports, the following recommendation was made by the Board at its February meeting:

After a careful study of the results obtained by the Pneumatic Torpedo and Construction Company, the Board finds that their system is the only one that has fully demonstrated an ability to safely and accurately project nitro-gelatin, or high explosives of equal power and sensitiveness, in large masses. Experiments are now in progress under the auspices of this Board with a view to discharging high explosives of sufficient power from powder guns, but success can not be said to have as yet been attained.

The batteries of 15-inch guns of this system that have been erected at Fort Hancock, New York Harbor, and Fort Scott, San Francisco Harbor, have shown that these guns are capable of throwing 100 pounds of nitro-gelatin to a distance of 4,800 yards; 200 pounds, 3,500 yards; and 500 pounds, 2,600 yards, with great accuracy.

As a projector of aerial torpedoes therefore at points on our coast where the channels are narrow and too deep to admit of being defended by subaquatic torpedoes, the Board believes that the pneumatic system might well find a place, and to this extent would recommend the adoption of the 15-inch gun and carriage as erected at Forts Hancock and Scott, with the changes in the position of the firing reservoir and in the location and capacity of the compressing plant proposed by the company, provided they give equal or greater efficiency, as the types for future constructions.

The Board has not, however, abandoned the expectation of some time being able to discharge aerial torpedoes of great capacity from powder guns, and experiments will be continued with that end in view.

AUTO-MOBILE DIRIGIBLE TORPEDOES.

The question of the adoption of a type for this very important adjunct to harbor defense is still in a very unsatisfactory state. As stated in the last report, the Halpine torpedo appeared to the Board promising, and one was ordered.

Lieutenant Halpine reports that he found it necessary to design and build a special type of motor in order to get the power required within the limited space and weight allowed, and that the first two of these motors built did not fulfill the contract requirements. Another is nearly finished, and it is expected that the torpedo will be presented for test soon after November 1, 1897.

Other torpedoes have been brought to the notice of the Board, such as the Patrick and Lay, but action upon them has been deferred until the result of the Halpine trial can be known.

The Patrick has been tested by the Navy and given excellent results, but is much more expensive than the Halpine. The Lay system has been used extensively in Europe.

These weapons, costing from $5,000 to $15,000 each, if provided in proper numbers, will require a very large outlay, and the Board is desirous of procuring the cheapest type that will effectively do the work.

RANGE FINDERS.

The only tangible advance in this subject during the year has been in the development of a supplementary or emergency depression range finder.

In addition to the principal range and position finders, placed at a distance from the guns, there should be others in the batteries themselves for use in case the communication with the range-finding station should be cut or the instrument should for any reason break down.

In order to provide for this contingency, the Board to Test Range Finders prepared the specifications for an emergency position finder. Under the advertisement issued, proposals to furnish two different instruments were received—the Lewis and the Rafferty. The price of the latter being the lower, it was ordered, and upon test it more than fulfilled the requirements. The Lewis was a portable modification of the larger instrument invented by Lieutenant Lewis, and, upon the application of that officer, this Board authorized a trial of it in competition with the Rafferty. The result of this test was not regarded as altogether conclusive, and it was decided to order both instruments for the typical artillery station at Fort Wadsworth, and to await the result of service use before recommending either type.

Range finder to be attached to the gun carriage.—This is a variation of the Rafferty position finder, which is intended to be attached to the sight standard of disappearing carriages. The range is given directly and the azimuth is of course shown on the traverse circle of the carriage. This departure from the ordinary range finder seemed to the Board worthy of trial, and an instrument has been ordered for the 10-inch battery at Fort Monroe.

Horizontal-base range finders.—Upon the recommendation of the Chief of Ordnance the Board allotted funds for the purchase of a Barr and Stroud fortress range finder. This is an English instrument, and consists of a tube 4½ feet long, with reflectors at each end, one of which reflects the upper part of an object, as a mast or smokestack, and the other the lower. By a movement of one of the reflectors the images are drawn together at the center, where the eye is placed, until they form an unbroken reflection, when the distance is read from a scale. The instrument is very convenient, but its base being no longer than the tube, 4½ feet, is very short for taking long ranges accurately. The range finder is undergoing test at the Sandy Hook Proving Ground.

The alternating current range and position finder.—This instrument was proposed by Professor Crehore and Lieutenant Squier, the inventors of the polarizing photochronograph, and appeared to the Board so promising, that an allotment was made for its construction. Lieutenant Squier reports that the working drawings are about completed and that the construction will not take much time.

The Ruckman-Crosby range finder.—One of these instruments was purchased by the Board eight years ago, and Lieutenant Ruckman is now engaged in improving the system. He reports a considerable advance in the development of his instrument.

The Lewis subscale.—This is an attachment to the azimuth circles of seacoast carriages, to enable the gunner to set the gun at a given azimuth quickly and accurately. It was fully tested by the Ordnance Board and by a board of artillery officers at Fort Monroe, and was found to be superior to the service index. This Board therefore recommended that it be adopted for service and the recommendation was approved by the Secretary of War.

HIGH EXPLOSIVES.

This subject has been in charge of Maj. Frank H. Phipps, Ordnance Department, acting as a committee of the Board. Very satisfactory progress has been made toward the selection of an explosive for shell charges, but further experiments should be made before finally deciding this matter.

The invention of a safe and effective detonator by Lieut. William S. Peirce, of the Ordnance Department, has also supplied a long sought for desideratum.

The report of Major Phipps is here embodied in full:

WAR DEPARTMENT, *October 19, 1897.*

GENERAL: The committee on high explosives has the honor to report that the only new explosives tested during the year were samples of wet gun cotton made by the New Explosive Company, of Stowmarket, England, and a smokeless powder manufactured by the Messrs. Du Pont for the .30-caliber rifle. This latter substance gave excellent results in the explosive chamber. An 8-inch steel shell containing $4\frac{7}{16}$ pounds of the explosive and fired by an electric primer was broken into 1,035 pieces and the wood lining of the chamber set on fire. Several charges of wet gun cotton made by the English company having been procured, it was considered advisable to make a comparative test of its merits with such gun cotton as could be procured in this country, and at the same time test some of the smokeless powder for .30-caliber rifle, above referred to. Accordingly, two shells were filled with the English wet gun cotton, two with some made by the Du Ponts, and two with the smokeless powder. All were fired under the same conditions of soil, depth, etc., as explosives previously tested by your committee.

Each shell was provided with an igniter of dry gun cotton ($\frac{1}{2}$ ounce), was buried so that the line of least resistance was in each case the same, viz, 3.7 feet, and was exploded by an electric battery and submarine mine fuse containing 24 grains of mercuric fulminate.

Using General Abbot's formula, $C=\frac{1}{17}[L+\frac{7}{8}(R-L)]^3$ in which—

C = equivalent of explosive gelatin.

R = radius of crater formed by explosion, and

L = line of least resistance (in the following cases 3.7 feet), we have the following results:

	Charge.	Crater radius (mean of 8 radii).	C=	Average.
	Pounds.	*Feet.*		
English gun cotton	8.5	3.79 and 4.36	3.18 and 4.61	3.89
DuPont's gun cotton	6.625	4.00 and 4.05	3.65 and 3.80	3.72
Smokeless powder	6.5	3.97 and 4.49	3.60 and 4.98	4.29

As 8.5 pounds of English gun cotton proved in trial to be equally effective as 3.89 pounds of explosive gelatin, it has 0.46 of its power. Du Pont's gun cotton has 0.56 of the power of explosive gelatin, and the smokeless powder 0.66 of the same.

In the early trials shells having an interior capacity of 192 inches were used. Those used in the trials just made had a capacity of 186 inches. It is necessary therefore, for a fair comparison with the results heretofore reported, to increase the weights actually inserted in the shells in the proportion of 186 to 192. We would then have for the—

English gun cotton, 8.67 pounds.
Du Pont's gun cotton, 6.84 "
Smokeless powder, 6.7 "

Hence, the relative merits of these explosives are represented by the products—

$$.46\times8.67=3.99$$
$$.56\times6.84=3.83$$
$$.66\times6.7=4.42$$

The corresponding figures of merit given for other high explosives are as follows:

Explosive gelatin, $1.00\times 10=10.$
Emmensite, $0.56\times9.8=5.49$
Wet gun cotton, $0.51\times6.2=3.16$

From the above we see that the density of loading of both the English and Du Pont gun cotton was greater than the English cotton previously tested by the committee of the board; that the weight of the English charge just tested was greater than that of the American product although but little greater in the order of merit. The smokeless powder tested has an order of merit next after emmensite, whose great fault of sensibility it possesses to an equal or greater degree.

Two tests to determine the effect of impact with shell loaded with the smokeless powder were made with the 7-inch Ames rifle against a 4-inch wrought-iron plate. Both shells exploded on impact.

It has been found that shell loaded with emmensite would not explode on impact against water, sand, or oak 3 inches thick, but against a 4-inch wrought-iron plate it exploded, making a rather clean hole, larger than the diameter of the shot whose fragments were generally carried through, although the detonation was not complete, as some unconsumed emmensite was found on the face of the plate. On a 6-inch plate the shell exploded, but the shell penetrated the plate, the point projecting 2 inches beyond. In a recent test, however, with a detonating fuse, a Midvale torpedo shell holding 89 pounds of emmensite penetrated a 3½-inch nickel steel plate and was detonated 5 feet back of the plate, entirely destroying and shattering the wooden chamber behind the plate.

As anticipated in my last report, an 8-inch B. L. rifle became available, and three rounds each of emmensite and wet gun cotton were safely fired with velocities of about 1,870 foot-seconds, and pressures ranging from 37,500 to 39,000 pounds per square inch. The shells were semiarmor piercing, made by the United States Projectile Company, and held 16$\frac{1}{8}$ pounds of emmensite and 15 pounds of Stowmarket gun cotton.

Believing that the action of these substances fired from the 12-inch steel mortar, with a 1,000-pound torpedo shell holding large charges, would be even more conclusive than results obtained from the 8-inch rifle, it was proposed to fire three rounds of each explosive from this mortar. One round with gun cotton has already been fired. The charge of wet gun cotton was 117 pounds. the propelling charge 49 pounds of smokeless powder, the resulting pressure being 33,000 pounds per square inch; estimated velocity 1,200 foot-seconds. The rest of the programme will be carried out as rapidly as possible.

Experiments continued by the Ordnance Department with the Peirce detonating fuse, referred to in my last annual report, have resulted most satisfactorily.

Referring now to the first report of the committee on high explosives, we find the following as the points to be investigated:

(1) Which is the best explosive for use in shells?

To decide this point we must consider (*a*) safety in handling and storage, regard being had to ordinary shocks and friction in handling, to deterioration in store, and to extremes of heat and cold; (*b*) intensity of action when exploded, and (*c*) density of loading.

(2) Is an explosion of the first order, or detonation, assured with the different modes of loading proposed by the inventors to prevent premature explosion?

(3) Will the explosive stand the friction due to rifled motion when loaded as proposed?

(4) Will the explosive stand the shock of firing when loaded as proposed by the different inventors?

(5) Will the igniting mechanism stand the shock of firing and the rifled motion without premature action?

(6) Will the igniting mechanism act as desired?

(7) Will the shell, without the igniting mechanism, explode on impact (*a*) with water, (*b*) with earth, (*c*) with stone, (*d*) with wood or light iron, and (*e*) with iron armor?

Experiments so far made indicate that wet gun cotton, emmensite, and certain grades of smokeless powder, with the Peirce detonating fuse, fulfill all the requirements of Nos. 2, 3, 4, and 5.

That they will not explode on impact against water, sand, or wood of ordinary thickness.

That shell charged with wet gun cotton will penetrate, without explosion, plates of 9 inches thickness, and that wet gun cotton fulfills all the conditions of requirement 1 except that of intensity of action and of density of loading, in which it is excelled by emmensite.

That emmensite has a greater density of loading than wet gun cotton which, with its slightly greater intensity of action, gives it an advantage. It is more sensitive than gun cotton and more susceptible to atmospheric conditions. It is thought, however, that any explosive that is adopted for a shell charge should be packed for issue in a metal case to be inserted in the shell when required. Such an arrangement would prevent the loss of moisture by gun cotton, and absorption by emmensite.

On firing it against both a 4-inch and 6-inch plate, the shell was exploded by either shock of impact or heat generated in penetrating plate. Yet with a detonating fuse it penetrated a 3½-inch nickel steel plate and was exploded 5 feet back of the plate.

Smokeless powders are more sensitive even than emmensite, and none of samples tested is adapted to use in guns of large caliber.

While these experiments have so far been generally satisfactory, the matter of a shell charge is of such great importance, involving as it does the safety of the gun detachments, further experiments will be made by the Ordnance Department before definitely deciding on the explosive to be used.

Very respectfully, your obedient servant,

FRANK H. PHIPPS,
Major, Ordnance Department, U. S. A.

Gen. NELSON A. MILES, U. S. A.,
President of the Board of Ordnance and Fortification, Washington, D. C.

IMPORTANT EXPERIMENTS.

Experimental parapet.—In the absence of reliable data as to the penetration of projectiles into sand backed by concrete and into concrete itself, the Board decided to make some experiments with a view to the accurate determination of the cover necessary to protect batteries against modern high-power guns.

Valuable results have been obtained, but are withheld from publication until the experiment is completed.

TYPICAL ARTILLERY STATION AT FORT WADSWORTH, NEW YORK HARBOR.

The Board having adopted a general system of fire control (see p. 17, report for 1896), it was regarded as very important that some artillery fire command should be completely equipped with all the appliances for effective defense that would be used in actual war, in order that the proposed system might be thoroughly tested at as early a date as possible. This seemed the only way by which the actual needs of the service could be accurately ascertained. It was also very desirable that a post should be so equipped in order that emplacements now rapidly being constructed might be prepared for the appliances that are required by modern warfare. This equipment was not to be simply experimental, but was designed to be a permanent preparation of the fortification selected for service in war and practice in peace.

After careful consideration, Fort Wadsworth, New York Harbor, was selected for the typical artillery station, on account of the advanced

state of its batteries, its accessibility to troops in the vicinity of New York, and the fact that considerable work on range finders, communications, etc., had already been done there by the Board on the Regulation of Seacoast Artillery Fire. The recommendation of an allotment from the Board's funds was approved by the Secretary of War, and the work is now well advanced, as will be seen by the report of the Board on the Regulation of Seacoast Artillery Fire in Appendix B.

BOARD TO TEST RANGE AND POSITION FINDERS.

The stations of some of the officers constituting this board having been changed, the necessity of further continuing it was taken up at the June meeting, and the following action was taken:

Since the organization of the Board to Test Range Finders in 1890 another board, designated the Board on the Regulation of Seacoast Artillery Fire, has been instituted at the instance of the Board of Ordnance and Fortification, whose duties include the establishment of rules and regulations for the use of range finders as well as other appliances employed in the adopted system of fire control, and necessarily require familiarity with these instruments.

It is the opinion of this Board that the maintenance of both of these boards is no longer necessary, but that the duties of the Board to Test Range Finders can be merged into those of the Board on the Regulation of Seacoast Artillery Fire. It is, however, desirable that when considering new types of range finders the Engineer and Ordnance departments should be represented on the board, as is now the case with the Board to Test Range Finders.

It is therefore recommended that the Board to Test Range Finders be dissolved, and that the duties of the board be transferred to the Board on the Regulation of Seacoast Artillery Fire, and that an officer of the Engineer Department and an officer of the Ordnance Department—preferably those who are now members of the Board to Test Range Finders—sit upon the said Board on the Regulation of Seacoast Artillery Fire when called together by its president for the purpose of considering range and position finders.

The board was accordingly dissolved and its duties transferred to the Board on the Regulation of Seacoast Artillery Fire.

THE BOARD ON THE REGULATION OF SEACOAST ARTILLERY FIRE.

The report of this board (Appendix B) shows the scope of its work during the year.

The board has submitted a system of regulations and tactics for fire control and direction for coast artillery service in accordance with the recommendation of this Board (see report for 1896, p. 18) which shows great ability and industry.

The chapters on coast defense and practice have been recommended to be printed in pamphlet form and a copy issued to each artillery officer. The remaining chapters on gunnery, ammunition, material, and drill have, at the request of the board, been returned to them for practical test at Fort Wadsworth. Such changes as appear necessary will be made and the regulations can then be published to the Army in permanent form.

ESTIMATES FOR THE COMING YEAR.

Owing to the fact that a number of allotments made by the Board were not entirely used and were revoked last year, thus increasing the funds at its disposition, the Board decided that the appropriation of $150,000 made for the past two years could be reduced to $100,000 without interfering with its work. An estimate was therefore made for this amount at the September meeting.

It is recommended that the appropriation be made as heretofore in a single amount to enable the Board to make all needful and proper purchases, experiments, and tests to ascertain, with a view to their utilization by the Government, the most effective guns, small arms, cartridges, projectiles, fuses, explosives, torpedoes, armor plates, and other implements and engines of war, and to purchase or cause to be manufactured, under authority of the Secretary of War, such guns, carriages, armor plates, and other war material as may in the judgment of the Board, be necessary in the proper discharge of the duty devolved upon it by the act approved September 22, 1888; to pay the salary of the civilian member of the Board of Ordnance and Fortification provided by the act of February 24, 1891, and for the necessary traveling expenses of said member when traveling on duty as contemplated in said act; for the payment of the necessary expenses of the board, including a per diem allowance to each officer detailed to serve thereon when employed on duty away from his permanent station, of $2.50 a day; and for the test of experimental guns, carriages, and other devices procured in accordance with the recommendation of the Board of Ordnance and Fortification.

CONCLUSION.

The work of arming our seacoasts is progressing with greater rapidity than ever before. Types of nearly every engine and appliance of war for our service are adopted and we have but to procure them to complete our defensive system. But we should not assume that we are secure because a few of our chief harbors are partially fortified. There is much left to do.

It is accepted by military and naval authorities that no fleet, unassisted by a land force, will ever undertake to capture a properly defended fortress. The danger is that a few swift and powerful vessels will run the batteries and once inside the defenses will hold a great city at their mercy To defeat such a raid every modern appliance of war should be in readiness. Torpedoes should be provided to be planted along their route, search lights to illuminate their course, range finders to accurately predict their position at every instant so that no shot will be wasted, and dirigible torpedo boats to attack at short range. All this requires much more than guns and carriages, and it is the purpose of the Board in equipping the typical artillery station at Fort Wadsworth to demonstrate how much the effectiveness of the armament can be increased by the appliances of scientific warfare.

The Board's special province is to investigate the material that will be used in coast defense, but it does not think that it transcends its duties if it point out to Congress the fact that the means of caring for and maneuvering all this costly armament that is being accumulated are entirely inadequate. Our splendid guns and scientific carriages will be of no avail without trained men to fight them, and an increase in the personnel of our fortress defenders is urgently demanded to keep pace with the development of our defensive system.

The anomalous status of our harbor defense by submarine mines also seems to require attention. The development of this important adjunct was confided to the Engineer Department and an admirable system has been designed, and torpedoes are in store ready for use at various points. It can not, however, be expected that this Department can, without assistance, fight these mines in time of war, as their regular duties with the armies in the field will take every available officer.

The torpedo defense is intimately connected with the fortress that guards the pass where the torpedoes are planted. They must be operated under its cover and must be defended against countermining by its guns. It seems, therefore, evident that the submarine mines should be under the same control as the contiguous forts, and that the Engineer Corps should be relieved from their care, so that the artillery garrisons may in time of peace become thoroughly familiar with their use.

In closing its report for the ninth year of its existence the Board would urge that there be no decrease in appropriations for coast defense.

A few more years of liberal expenditures will insure the safety of our harbors, and the work should not be left in a weak and incomplete condition.

NELSON A. MILES,
Major-General Commanding U. S. Army, President of the Board.

ROYAL T. FRANK,
Colonel, First Artillery, U. S. Army.

PETER C. HAINS,
Colonel of Engineers, U. S. Army.

FRANK H. PHIPPS,
Major, Ordnance Department, U. S. Army.

JOSEPH H. OUTHWAITE,
Civilian Member, Board of Ordnance and Fortification.

J. C. AYRES,
Captain, Ordnance Department, U. S. Army, Recorder of the Board.

APPENDIX A.

TABLE SHOWING ALLOTMENTS MADE BY THE BOARD OF ORDNANCE AND FORTIFICATION FROM OCTOBER 31, 1896, TO OCTOBER 31, 1897, INCLUDING STATEMENT OF UNEXPENDED BALANCES UNDER THE SEVERAL APPROPRIATIONS.

Act of September 22, 1888.

Balance on hand October 31, 1896	$5,392.60
Allotments during the year	.....
Balance available for allotment	5,392.60

Act of March 2, 1889.

Balance on hand October 31, 1896	$14,775.00
Allotments during the year	.....
Balance available for allotment	[1] 14,775.00

Act of August 18, 1890.

Balance on hand October 31, 1896		$15,355.69
Allotments during the year:		
May 12. For field carriage for 37 mm. gun	$5,000.00	
June 15. For Stroobants range finders	50.00	
		5,050.00
Balance available for allotment		10,305.69

Acts of July 23, 1892, February 18, 1893, August 1, 1894, March 2, 1895, June 6, 1896, and March 3, 1897.

Balance on hand October 31, 1896	$152,354.92	
Act of March 3, 1897	150,000.00	
		$302,354.92
Allotments during the year:		
Nov. 17. Purchase of Batson-Sawtelle road level	200.00	
17. Material for Lieut. S. E. Allen in development of azimuth and range indicator	225.00	
18. Rafferty relocator, drawing material, etc	1,425.00	
Dec. 15. Construction of 10-inch Brown wire-wound gun	33,000.00	
15. Installation of alternating-current range finder	3,300.00	
15. Additional payments in connection with photo-chronograph	443.13	
16. Portable boiler, etc., for search-light engine at Fort Monroe	1,150.00	
16. Three Rafferty relocators	2,598.00	
Jan. 12. Emergency range finder	975.00	
12. Telescopic bore sight	75.00	
Feb. 9. Procure and test 1 Stackpole telescopic sight	250.00	

[1] Available only for the purchase of movable submarine torpedoes.

Allotments during the year—Continued.				
	9.	Typical artillery station		$13,000.00
	9.	Typewriting, etc., for Board on Regulation Seacoast Artillery Fire		300.00
	10.	Procure and finish castings for mounting certain guns at Sandy Hook		444.00
Mar.	3.	Expense of conducting test of 8-inch Haskell gun		73.00
	3.	Expense connected with test of Sheehy printing telegraph		75.00
Apr.	14.	Material furnished in test of Haskell gun		54.10
	14.	Tests of metal at Watertown Arsenal		1,000.00
May	12.	Purchase of polarizing photochronograph		4,250.00
	13.	Additional work on parapet at Sandy Hook		1,000.00
	13.	Primers, fuses, etc., consumed at Sandy Hook		3,000.00
July	13.	6-inch rapid-fire gun and mount		18,110.00
Sept.	21.	Rafferty depression range finder		690.00
	22.	3-inch gun and two mounts		11,500.00
	22.	Work on experimental parapet		1,500.00
Oct.	19.	3,000 3-inch projectiles		6,450.00
		800 5-inch projectiles		3,240.00
		500 6-inch projectiles		2,640.00
		Smokeless powder for field guns		7,500.00
		Powder for experimental 5-inch rapid-fire gun		7,000.00
		Smokeless powder for 6-inch gun		12,500.00
		Removal of 10-inch pneumatic carriage at Sandy Hook		350.00
		Removal of modified Gordon 10-inch carriage		400.00
		Apparatus for ascertaining bursting time of fuses, etc		525.00
	20.	To procure and test rapid-fire field guns and carriages		20,000.00
	20.	For steel-rail parapet		10,000.00
	20.	Installation of photochronograph at Sandy Hook		125.00
		Expenses of the Board		9,800.00
		Total		179,167.23
Revocations of allotments under these acts:				
Dec.	15.	From allotment of May 7, 1896, for installation of telephone system at Fort Wadsworth	$15.35	
Feb.	9.	From allotment of July 2, 1896, for visual target indicator	11.18	
Mar.	9.	From allotment of Oct. 19, 1896, for visual target indicator	24.26	
June	15.	From allotment of March 3, 1897, for test of Sheehy printing telegraph	10.00	
		Total		60.79
		Total net allotments		$179,106.44
		Balance available for allotment		123,248.48

RECAPITULATION.

Act.	Balance on hand Oct. 31, 1896, and appropriated during the year.	Allotments during the year.	Allotments revoked.	Balance on hand available for allotment.
September 22, 1888	$5,392.60			$5,392.60
March 2, 1889	14,775.00			14,775.00
August 18, 1890	15,355.60	$5,050.00		10,305.60
July 25, 1892; February 18, 1893; August 1, 1894; March 2, 1895, and June 6, 1896	152,354.92	179,167.23	$60.79	123,248.48
March 3, 1897	150,000.00			
Total	337,878.21	184,217.23	60.79	153,721.77

APPENDIX B.

BOARD ON REGULATION OF SEACOAST ARTILLERY FIRE.

ARMY BUILDING,
New York City, October 31, 1897.

SIR: I have the honor to submit the following report of the operations of the Board on the Regulation of Seacoast Artillery Fire during the period from October 31, 1896, to October 31, 1897:

Pursuant to Special Orders, No. 302, Adjutant-General's Office, series 1896, I assumed the duties of president of the board. First Lieuts. W. C. Rafferty, First Artillery, and I. N. Lewis, Second Artillery, were relieved from duty as members of the board, and First Lieut. C. F. Parker, Second Artillery, detailed as a member by Special Orders, No. 40, current series, Adjutant-General's Office. Lieutenant Lewis, by the same order, reported to the board for such duty as the board might assign to him pertaining to the installation of the type system for the control of artillery fire at Fort Wadsworth, New York Harbor.

Pursuant to Special Order, No. 98, current series, Adjutant-General's Office, First Lieut. William H. Coffin, Fifth Artillery, reported as an additional member of the board.

Pursuant to Special Orders, No. 155, current series, Adjutant-General's Office, the duties of the late Board to Test Range and Position Finders were transferred to this board, together with their records, and Maj. J. G. D. Knight, Corps of Engineers, and Capt. Frank E. Hobbs, Ordnance Department, United States Army, were detailed as additional members to sit upon it only when called together by its president for the purpose of considering range and and position finders.

INSTRUMENTS.

Megaphone.—Reported by the board, March 30, 1897, as of no practical use in the service.

Converter board.—Suggested by First Lieut. (now captain) C. L. Best, First Artillery, and reported by the board, March 30, 1897, as not recommended for adoption.

Elevation indicator.—Letter and design submitted by First Lieut. W. C. Rafferty, First Artillery, and reported by the board, March 30, 1897, as not adapted to service use.

Range and position finder.—Proposed by Capt. S. E. Stuart, Ordnance Department, and reported by the board, March 30, 1897, "that the ideas suggested are of no use to the board at the present time."

Sheehy telotype.—Reported by the board, April 26, 1897, as follows: "For general transmission of intelligence highly satisfactory; but for transmission of range and azimuth, practically instantaneous service is requisite (if possible); this the Sheehy telotype does not give." Held for further test at Mr. Sheehy's risk.

Phillips relocator.—Reported by the board, May 8, 1897, as not recommended for adoption.

Dial telegraph.—The board recommended, February 5, 1897, that two sets be purchased. This was authorized May 12, 1897. Only one complete set has been made so far and this was tested by the board September 1, 1897, with satisfactory results.

In considering the subject of the means of transmitting ranges and azimuths to the guns from the battery commander's station, the board decided—

To equip the Clifton Battery with the dial telegraph (one set of transmitters and three sets of receivers).

To equip the Ravenna Battery with the Sheehy telotype (three instruments).

To equip the 8-inch B. L. R. battery with telephones (five telephones).

Thus testing thoroughly the three means of transmission under the same conditions.

RANGE AND POSITION FINDERS.

Under date of June 15, 1897, the board was directed to make further tests on the Lewis and the Rafferty supplementary range finders with a view of determining which of the instruments is the better for service use. The board reported, August 13, 1897, that the Lewis supplementary depression position finder was the better for service use.

FIRE COMMAND.

(1) Clearing off of trees, necessary to secure an unobstructed line of sight between the different stations of the command and the water area, was effected during the latter part of August last.

(2) Survey, establishing the position of guns and stations, was completed in September last.

(3) Equipment of stations is as follows:

Fire commander's.—Position finder. Telephone. Chart. Table of fire. Alphabetical list of American and foreign armored and unarmored ships, with plates of each type.[1]

Battery commander's (station in battery).—Pedestal for supplementary depression position finder. Speaking tubes or telephones to his guns.

Position finder.—Position finder, Type A. Instrument for observation of fire.[2] Chart. Tables of fire. Dial telegraph or telotype. Meteorological instruments.[3] Wind vane with decomposing attachment.[4]

(4) Communications between stations and guns. All stations connected by telephone; also a telephone at each gun in each battery.

F station is connected with the guns of the Ravenna battery by Sheehy telotype.

G station is connected with each gun of the Clifton battery by dial telegraph.

A telephone in the dynamo room connects with every station.

The wiring for the above has all been completed up to making the final connections, which can not be done until the stations are finished.

(5) Searchlight. The work on this is covered by Lieutenant Lewis's report. (See page 845.)

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[1] Not yet made out.
[2] Not yet provided for.
[3] Not furnished yet.
[4] Not made.

REGULATIONS AND TACTICS FOR FIRE CONTROL AND DIRECTION FOR COAST ARTILLERY SERVICE.

Pursuant to instruction from the War Department, under date of January 22, 1897, the board was directed to complete the proposed system of regulations and tactics for fire control and direction for coast artillery service.

The system, as prepared by the board, is herewith submitted and marked B.

As the works at Fort Wadsworth have not yet been completed, no practical application of this system has been had, and without which no system can be perfected. It is therefore requested that the inclosure marked B, elaborating this system, may be returned to this board for the practical test and consequent perfection as soon as Fort Wadsworth is made available for this purpose.

RECOMMENDATIONS.

(1) That power be applied to the heavy guns for elevating and traversing, and to the retraction gear, and also to the ammunition lifts, to save time and men.

(2) That suitable supports for the sponge and rammer staves be supplied on the outside of the loading platform, so that they may hang vertically, be convenient of access, and out of the way. When resting on props on the platform they are in the way.

(3) That provision be made for giving direction by open sights.

(4) That a battery of rapid-fire guns of the largest caliber be included in the armament of the fire command.

(5) As Part V (Coast Defense) and Part VI (Practice) will undergo but little, if any, change, if approved by the Honorable the Secretary of War, it is recommended that they be printed in pamphlet form and distributed to all artillery officers, in order that they may become familiar with them as soon as possible.

(6) That provision be made now for immediately extending the operation of the system in New York Harbor so as to include the district comprising Fort Wadsworth, Fort Hamilton, Fort Hancock, and Plumb Island, and, in the near future, the fortress of New York, comprising the district of the Lower Bay and the district of the Sound, the latter comprising Forts Schuyler and Slocum, Willets Point, and other adjacent posts.

Very respectfully, your obedient servant,

JNO. I. RODGERS,
Colonel Fifth United States Artillery, President of the Board.

The RECORDER OF THE
BOARD OF ORDNANCE AND FORTIFICATION,
Washington, D. C.

A.

FORT WADSWORTH, NEW YORK HARBOR,
September 20, 1897.

SIR: In accordance with the instructions contained in your letter of the 27th ultimo, I have the honor to submit herewith a detailed report

on the equipment of the typical artillery fire command at this post, the installation of which I am supervising under the direction of your board.

Very respectfully, your obedient servant,

I. N. LEWIS,
First Lieutenant, Second United States Artillery.

Col. JOHN I. RODGERS,
Fifth Artillery, President Board on Regulation of Seacoast Artillery Fire, Army Building, New York City.

PROGRESS REPORT ON TYPICAL ARTILLERY FIRE COMMAND AT FORT WADSWORTH, NEW YORK HARBOR.

According to the plans and estimates originally prepared by the Board on the Regulation of Seacoast Artillery Fire and approved by the Board of Ordnance and Fortification, this artillery fire command, which is intended to be a type of its kind, will consist when completed of the following elements:

First. Three separate batteries or groups of guns completely equipped for service—one battery of five 8-inch B. L. guns and two batteries of two 10-inch B. L. guns each, all mounted on disappearing carriages.

Second. One fire commander's station, with instruments, complete.

Third. Three position-finding stations, with instruments, complete.

Fourth. One power and electric plant, consisting of oil engine, dynamo, and switch board, with the necessary fuel, oil, tools, and instruments.

Fifth. A storage battery plant of 60 cells, constituting a convenient reserve of light and power for the different stations, when the main power plant is not in operation or is temporarily disabled.

Sixth. Two electric search lights, 60,000 candle-power beam, properly installed and wired.

Seventh. The necessary electrical lines and means of communication between the various parts of the command.

The total estimated cost of the entire equipment, exclusive of the armament, amounted to $24,384.

A complete list of the instruments and materials needed in the work includes—

1 engine and dynamo room.
1 storage-battery room.
1 shelter for fire commander's station.
3 shelters for position finders.
1 oil engine, 22 horsepower.
1 dynamo, 15 K. W.
1 switch board with instruments.
1 storage battery, 60 cells.
4 large depression position finders.
3 supplementary depression position finders.
5 converting instruments.
5 instruments for atmospheric corrections.
6 stop watches.
3 electric clocks with gongs.
1 set dial telegraph.
1 set printing telegraph.
15 special Bell telephones.
2 search lights, complete.
7 telegraph keys and sounders.
50 telegraph poles, with 6-pin cross-arms.
1 complete set wiremen's tools.
2 foundations and shelters (temporary) for search lights.
7,000 feet No. 4 copper wire, weatherproof insulation.
10,000 feet No. 14 twin wire for telephone and telegraph.

3,500 feet No. 18 6-core cable for dial telegraph.
1,000 feet interior conduit tubing, with elbows and connectors.
1,000 feet No. 14 twin wire for lamp circuits.
75 lamp fixtures, with fuse blocks and switches in boxes.
4 small switch boards for telephones.
2 lightning arresters for protecting dynamo.
3 difference cylinders or discs for replotting.
The necessary harbor and firing charts.
Three special instruments for observing effects of fire.

The Board of Ordnance and Fortification at its meeting February 9, 1897, made an allotment of $13,000 to cover the cost of so much of this equipment as could not be supplied by the Engineer and Signal departments.

On January 18, 1897, the Board of Engineers recommended allotment of sufficient funds to complete the following portion of the work:

First. To prepare two casemates in Fort Tompkins to serve as engine and dynamo room and storage-battery room.
Second. To purchase the oil engine, dynamo, storage battery, and switch board.
Third. To provide the necessary material and labor to install the electric plant and light the batteries.
Fourth. To erect the shelters for fire commander's station, and position finders.
Fifth. To provide the foundations and shelters for the two search lights.

The Chief Signal Officer has supplied the fifteen special telephones, the set of wiremen's tools, and the necessary poles and wiring to establish telephonic and telegraphic communication throughout the command.

The first work of construction was begun by the Engineers the second week in March. One of the casemates in Fort Tompkins was fitted up to receive the engine and dynamo. A concrete floor 7 inches thick was laid, with a concrete foundation for the engine 3 feet deep. The walls and ceiling were whitewashed and an end casing of wood with double doors and windows was put in. By the end of March the room was ready. An adjoining casemate was then similarly prepared to receive the storage battery.

The oil engine, with the necessary piping and water tanks, and the storage battery reached the post April 1st, and the work of installation was immediately begun.

By the end of April the engine was properly installed, the dynamo and switch board in place, and the poles, cross arms, and No. 4 copper wire for carrying current to the new 10-inch batteries, had been received.

On the recommendation of the board, approved by the Board of Ordnance and Fortification, the War Department authorized the detail of two enlisted men of the garrison on extra duty, one as mechanic and engineer, and the other as laborer and wireman, to assist in the care, installation, and operation of the plant. Accordingly, on the 1st of May, the post commander detailed Private Edward Lawrence, Battery I, Fifth Artillery, on extra duty as mechanic, and Private William Thomas, Battery K, Fifth Artillery, on extra duty as laborer, with orders to report to me for instructions.

These two men have been continuously employed since that date, and have performed their duty in the most satisfactory manner.

During the month of May the interior wiring in the dynamo room and storage-battery room, including the switch-board connections, was completed; the storage battery was set up and charged, and work was begun on the outside lines leading from the dynamo to the batteries.

In June all the poles for the different electric-light, telephone, and telegraph lines were erected, the cross arms, insulators, and guys secured in place. The lightning arresters were put in, and all the

heavy copper wire leading to the batteries and position-finding stations were properly strung. The material for the interior wiring of the new 10-inch batteries began to arrive the last week in June.

The work of putting in conduit tubes and installing lamps and switches in these two batteries was commenced July 1st. It was finished three weeks later. A civilian wireman was employed for sixteen days of this time, in order to assist and thoroughly instruct Privates Lawrence and Thomas in the practical details of such work. No other outside assistance has been or will be required to complete all the electrical work of the command.

The forty 16-candlepower incandescent lamps of the two batteries were turned on for the first time July 24th. Since that date all the light needed by the workmen in completing the magazines, shell rooms, and passageways has been supplied by the storage battery, which is kept constantly charged for this purpose. I have frequently tested the lighting circuits since the lamps were first put in, but find almost no leakage or trouble of any kind, although the magazines and other rooms are excessively damp at all times. The conduits, lamp boxes, and switch boxes are all water-tight. The lamp bulbs are protected from mechanical injury by strong wire guards.

Early in August No. 4 copper wires were strung from the dynamo circuit to the sites chosen for the search lights, but since the foundations and shelters were not built the final wiring connections could not be made. As it was desirable to secure an unobstructed line of sight between the different stations of the command, in order to determine by triangulation the exact relative positions of these stations, the men were employed during the latter part of August in clearing away the intervening trees and shrubs.

On September 1st work was begun on the telephone and telegraph lines, as the necessary materials were all at hand. With the exception of the final switch-board connections this work is now completed. Nothing more can be done with this wiring until all the shelters are finished, when the telephones and dial and printing telegraphs will be installed.

The plant, so far as completed, is in satisfactory working condition. The engine and dynamo have run smoothly and without a single mishap from the start in July until the present time. The storage battery is the very best of its kind.

Instead of purchasing two search lights, as contemplated in the original estimates, the Board of Ordnance and Fortification accepted the offer made by the General Electric Company to loan for such experimental tests as might be desired two of their largest (30-inch) projectors, without expense to the Government other than the cost of transportation. These projectors were received, complete and in good order, on the 25th of June.

To test the electrical adjustments and to become familiar with the working of the apparatus, I have set up one of the projectors temporarily on the parapet near the engine room, but it will not be possible to make a satisfactory service test of the lights until the apparatus is properly installed on suitable foundations. The electric plant has sufficient capacity to supply current for both lights in series. Each one requires about 80 ampères at 75 volts pressure, but by connecting them in series it will be possible to run both lights on 80 ampères at about 100 volts pressure.

The fifteen special "bridging" telephones obtained through the Chief Signal Officer from the American Bell Telephone Company, under life-

rental contract, were received August 3d. These telephones are so wound that the electrical resistances in the call bell, in the receiver, and in the secondary coil of the transmitter are all equally high (1,000 ohms), and each acts as a high resistance "bridge" across the circuit. This construction permits of multiple wiring throughout, and obviates the necessity of a central station, without impairing the usefulness of the telephones.

No practical service test of the system will be possible until all the different stations are completed, although the experience had with the ten telephones, five at Fort Wadsworth and five at Fort Hamilton, working in multiple over the submarine cable, justifies the conclusion that this is the most satisfactory arrangement for military purposes within the limits of a single command.

The present status of the work of the entire fire command may be briefly summarized as follows:

ENGINEER DEPARTMENT.

ARMAMENT.

The 8-inch battery complete and ready for service.

One 10-inch battery (Clifton), emplacements finished, guns mounted and ready for service, except that sights are not adjusted and one loading tray is lacking.

One 10-inch battery (Ravenna), emplacements finished, guns at post but not mounted; carriages, breech mechanisms, and equipments not yet received.

CONSTRUCTION.

Work on engine room and storage-battery room completed. The shelter for fire commander's station finished. The three shelters for position finders in progress of construction. Foundation and shelters for search lights not yet begun.

Apparatus, material, and labor purchased.

	Cost.
Oil engine (22 horsepower), complete	$1,493.63
Installation and transportation of engine	45.00
Storage battery, 60 cells	644.00
Switchboard and instruments	218.00
Dynamo, 15 K. W	375.00
Belting	26.00
Oils, lubricating	8.50
Cotton waste and sundries	5.85
Copper wire, switch cord, and tape	173.75
Cross arms, pins, insulators	27.70
Erecting light poles, labor	87.50
Wiring batteries, 16 days, at $3	48.00
Lamp fixtures, conduits, boxes, switches, lamps, etc	225.20
Total	3,378.13

SIGNAL DEPARTMENT.

Instruments and materials furnished.

	Cost.
50 telegraph poles, 30 foot, dressed and painted	$237.50
13,500 feet aerial cable for telephone and telegraph	311.25
15 special telephones, complete	357.90
Set wiremen's tools, complete	21.52
Tape	5.60
3 miles galvanized iron wire for guys	49.90
Total	983.67

BOARD OF ORDNANCE AND FORTIFICATION.

[$13,000 allotted.]

Already purchased.

	Cost.
10 barrels kerosene, for fuel	$40.00
Wiring, fuze blocks, and switches, etc., for installation of search lights	112.97
Set dial telegraphs: 3 transmitters, 3 receivers	695.00
1 special clock for time intervals	40.00
6 gongs for clock circuit	25.50
Total	913.47

Under contract, but not delivered.

	Contract price.
3 large depression position finders, complete with replotters	$5,100.00
1 replotting board (converter)	225.00
2 extra sets dial telegraph receivers (2 information dials, 2 range dials, 2 azimuth dials)	240.00
Total	5,565.00

Needed to complete work, but not yet ordered.

	Estimated approx. cost.
2 replotting boards	$500.00
2 supplementary depression position finders	1,500.00
3 instruments, with special telescopes for observing effect of fire	1,800.00
4 stop watches	20.00
Set printing telegraph (Sheehy telotype)	1,100.00
50 barrels kerosene, for fuel	200.00
5 instruments for atmospheric corrections	250.00
4 small station switchboards for telephone and telegraph connections	25.00
12 protected hand lamps and fixtures	50.00
Lamps and fixtures, with wiring, to fit up stations when completed	50.00
1 Wheatstone bridge testing set, complete with standard cells	55.00
1 portable voltmeter, double reading	45.00
3 difference disks or cylinders for replotting	75.00
1 magneto and bell for testing	4.50
Preparation of charts for command, engraving, printing, and materials	200.00
Extra-duty pay of two enlisted men for one year	310.25
Hard coal fuel for stoves in engine room and storage battery room for one year	40.00
Incidentals and expenses of equipment—experimental work	196.78
Total, estimated	6,521.53
Total under contract	5,565.00
Total already paid out	913.47
Allotment	13,000.00

The estimated cost of instruments and material needed to complete the equipment as given above is a maximum in every instance. The allotment of $13,000 already made is therefore amply sufficient to complete the work.

A comparison of the actual cost of apparatus, materials, and labor already purchased, with the original estimates, shows that there has been a saving in almost every case.

In the matter of telephones and telephone and telegraph wiring alone there has already been a saving of $1,302.13.

As there is much unavoidable delay in procuring these various articles of equipment by public advertisement, I would respectfully urge the desirability of advertising for the remaining articles as soon as possible.

Respectfully submitted:

I. N. LEWIS,
First Lieutenant, Second Artillery, in charge of Installation.

Deep
Deep

INDEX.

Adjutant-General, report of, to the Secretary of War, 13, 215.
Report to Major-General commanding, 97.
Adjutant-General's Office, 19, 224.
Ainsworth, Col. F C., 53.
Report of, 709.
Alaska, 9, 90, 198.
Alcoholism, 495.
Alden, Col. C. H., report of, 430.
Alger, Secretary R. A., report of, 61.
Ammunition, 44, 45.
Anderson, Capt. G. S., 175.
Animals, public, 148.
Antietam battlefield, 57, 60.
Antietam Battlefield Board, abstract of report, 57.
Apprentice battalion, 20, 23.
Appropriations, 1896-97; statement of:
Artificial limbs and appliances, 83.
Arsenal, 66.
Civil surveys, 83.
Fortifications, 67.
Harbors and rivers, 68.
Military Academy, 66.
Military establishment, 65.
Military posts, 67.
Miscellaneous objects, 82.
Monuments, etc., 64.
National cemeteries, 82.
Public works, 66.
Relief acts, 85.
Salaries, contingencies and civil, 64.
Signal Corps, 82.
War claims of States, 83.
War claims of volunteers, 84.
Washington City, buildings and grounds, 65.
Appropriations for 1897-98, 60.
Aransas Pass Board, 39, 40.
Arlington Memorial Bridge, 39.
Armament of fortifications, 47.
Army, 89.
Army, increase, 94.
Actual strength (table), 100.
Report on, by Major-General commanding, 3.
Army and Navy general hospital, Hot Springs, 29, 30, 255, 421.
Army Medical Museum, 423.
Army Medical School, 428.
Course of lectures, 431.
Duties of medical officers, 430.
Military medicine course, 434.
Military hygiene lectures, 435.
Order of duties, 430.
Report on, 428, 430.
Armories, arsenals, and depots, list of, 114.
Arnold, Col. A. K., report of, 204.
Artificial limbs, 28, 411.
Artillery, increase of, 18, 93, 98, 221.
Artillery horses, 3, 23, 358.
Condemnation of, 149, 154.
Artillery post, 134.
Artillery practical exercises, 210.
Artillery school, library, 210.
Report of commandant, 207.
Artillery target practice, 133, 187.
Athletics, 132, 195.
Auction sales, 149.
Ayres, Capt. J. C., 837.
Baggage, allowance of, 139.
Ballistics, 208.
Balloons, 50, 51, 672.
Band instruments, 345.
Bannister, Capt. W. P., report of, 511.
Barracks, 184.
Barracks and quarters, 323.
Belknap, H. R., address to graduating class, Military Academy, 789.
Report of, 785.
Bell, Col. W. H., 27.
Bellinger, Capt. J. H., report of, 815.
Bird, Maj. Charles, 354.
Bismarck Military Post, N. Dak., 25, 325, 370.
Blouses, 341.
Board of Ordnance and Fortification:
Allotments, 821, 838.
Appropriations, 821.
Coast and harbor defense, 836.
Contract guns, 825.
Estimates, 835.
Experimental guns, 824.
Experiments, 334.
General operations, 822.
Gun carriages, 828.
Heavy rapid-fire guns, 826.
High explosives, 822.
methods of throwing, 820.
Range finders, 831, 835.
Rapid-fire field guns, 828.
Seacoast artillery fire, 835.
Smokeless powder, 829.
Report, 10, 821.
Torpedoes, etc., 830.
Boynton, H. V., 55.
Breck, Gen. S., 15, 20, 101.
Report of, 224.
Breckinridge, Gen. J. C., report of, 22, 755.
Report on Soldiers' Home, 755.

Brooke, Gen. J. R., report of, 166.
Bruff, Capt. L. F., report of, 787.
Bruff, Capt. L. L., report of, 810.
Buffington, Col. A. R., 46, 48.
Burton, Col. G. H., 117, 138, 141.
Butts, Lieut. E. L., 101.
Cadets, military, examination of, 438.
Cadle, Cornelius, 59.
California. *See* Department of.
Cap devices, 321, 341.
Caps, undress, 341.
Cavalry and Light Artillery School, 100.
Cavalry drill, 135.
Cavalry horses, 323, 358.
  Condemnation of, 148, 154.
Cavalry post, 21.
Cemeteries, national, 256, 326, 383.
  Post, 144.
Census of posts, 146.
Cerebro-spinal meningitis, 466.
Chaplains, 18, 220.
Chevrons, service, 343.
Chickamauga and Chattanooga National Park, 56,
  Commission, report of, 56.
Chief of Engineers, abstract of report, 33.
Chief of Ordnance, abstract of report, 44.
Chief Signal Officer, report of, 667.
  Abstract of report, 49.
Civilian attaches, medical statistics regarding, 501.
Clerical force in Army, 19.
  Office Commissary-General, 393.
Clerks to paymasters, 33.
Clothing, 174.
  And equipage supplies, 337.
  For discharged prisoners, 340.
  Purchased, issued, etc., 347.
  Regulations, 346.
Coast and harbor defense, 91. *See* Board of ordnance, etc.; *also* Seacoast defenses.
Colorado. *See* Department of.
Colleges, military, 257.
  Arms and equipments, 261.
  Discipline, 260.
  Drills, 262.
  Inspections, 267.
  Military course, 270.
  Military organizations, 259.
  National flag at, 269.
  Professors, 268.
  Students, 253.
  Uniforms, 260.
Commissary-General of Subsistence, report of, 26, 391.
Commissary-sergeant, 398.
Companies, interior economy of, 145.
Coppinger, Gen. J. J., 184.
  Report of, 175.
Courts martial, general, 281.
  inferior, 283.
Crowder, Maj. E. H., report of, 295.
Crosier, Capt. William, 46, 48.
Dakota. *See* Department of.
Davis, Maj. G. W., 57, 58, 715.
Department of California:
  Health, 460.
  Report of commanding general, 185, 187.
  Troops in, 106, 186.
Department of Colorado:
  Health, 460.
  Report of commanding general, 168, 175.
  Troops, 104, 168.
Department of the Columbia:
  Health, 461.
  Report of commanding general, 197.
  Troops, 106, 198.
Department of Dakota:
  Health, 458.
  Report of commanding general, 187.
  Troops, 104, 187.
Department of the East:
  Health, 456.
  Report of commanding general, 166.
  Troops, 102.
Department of the Missouri:
  Health, 458.
  Report of commanding general, 166.
  Troops, 102.
Department of the Platte:
  Health, 459.
  Report of commanding general, 175, 184.
  Troops, 106, 175.
Department of Texas:
  Health, 459.
  Report of commanding general, 192.
  Troops, 106, 193.
Deserters, identification of, 439.
  rewards for, 287.
Desertion, removal of charges, 51, 697.
Desertions, 99, 186.
Detached service of officers, 97, 221.
Deep Waterways Board, 39, 42.
Deep waterway channel through Great Lakes, 42.
Deposits, soldiers, 652.
Diabetes mellitus, 507.
Diarrhea, 499.
Diphtheria, 464.
Disappearing gun carriage, 45, 48.
Discharges, certificates of, 51.
  statistics of, 51.
Disease, influence of age, nativity, etc., on susceptibility to, 497.
Diseases, special:
  Alcoholism, 495.
  Cerebro-spinal meningitis, 466.
  Diarrhea, 499.
  Diphtheria, 464.
  Influenza, 463.
  Injuries, 497.
  Malarial infections, 479.
  Measles, 462.
  Mumps, 463.
  Pneumonia, 496.
  Rheumatic affections, 495.
  Scarlet fever, 462.
  Smallpox, 463.
  Suicides, 497.
  Tuberculosis, 496.
  Typhoid fever, 468.
  Typhoid serum diagnosis, 474.
  Venereal affections, 494.
Documents of War Department, 50, 677.
Dodge, Capt. F. L., 304.
Drills, 124, 130.
  halls for, 90, 124.

East. *See* Department of.
Ebens, G. J. F., report of, 785, 784.
Emergency ration, 27, 31, 394.
Test of, 401.
Encampments, summer, 355.
Engineer School, Willets Point, 37.
Engineer troops, 34, 40.
Enlisted men, 18, 98, 121, 221.
Ernst, Col. O. H., report of, 800.
Estimates for 1898-99, 25, 60.
Expenditures 1897-98, 60.
Field and siege carriages, 46.
Fire protection, 142.
Fires, 189.
Flagler, Gen. D. W., 48.
Fleming, J E., 784.
Flood sufferers, relief of, 27, 395.
Forage, cost of, 164.
Fort Baker, 90, 185.
Bliss, 366.
Brown, river front, 196.
Ethan Allen, Vt., 4, 365.
Hamilton, N. Y., 366.
Hancock, N. J 324, 368.
Harrison, Mont., 24, 324, 366.
Monroe, Va., 25, 235, 370.
Myer, Va., 365.
Riley Kans., 24, 324, 369.
D. A. Russell, Wyo., 25, 335, 370.
Wayne, Mich., 24, 324, 366.
Fortifications, appropriations, 67.
See Board of Ordnance, etc., and *see* Coast defenses.
Forwood, Lieut. Col., report by, 433, 732.
Frank, Col. R. T reports by, 212, 837.
Frankfort Arsenal, 44, 48.
French Capt. J T 382.
Fuel, cost of, 164.
Gardens, post, 145.
Garlington, Maj. E. A., 117.
Gauntlets, 342.
General service clerks and messengers, 196.
Gettysburg battlefield, 54, 60.
Commission, abstract of report, 54.
Electric Railroad, 54.
National Military Park, 54.
Gillis, Lieut. Col. J., report of, 327.
Glenn, Capt. E. F., 300.
Good-conduct badges, 240.
Graham, Gen. W. M., 192.
Grant statue, 60.
Greely, Gen. A. W., 50, 678.
Groesbeck, Maj. S. W., report of, 292.
Guards, 128.
Gymnasia, 21.
Gymnasiums, 101.
Gymnastics, 122.
Hains, Col. E. C., report by, 837.
Hall, Lewis W report of, 784.
Hall of records, 19, 25, 26, 223, 327.
Harbors and rivers, appropriations, 68.
Hasbrouck, Maj. H. C., 117, 124, 128, 129, 134, 141.
Hawkins, Col. H. S., report of, 204.
Health:
Of the Army, 29, 30, 454.
Department of California, 460.
Health—Continued.
Department of Colorado, 460.
Columbia, 461.
Dakota, 458.
the East, 456.
Missouri, 458.
the Platte, 459.
Texas, 459.
Highest and lowest rates at individual posts, 461.
Heliograph, instruction for using, 681.
Hernia, operations for, 442.
Hughes, Col. R. P., 117.
Hunter, Lieut. Col. Edward, report of, 288.
Huntington, Col. D. L., report of, 433.
Horses, 121.
See Artillery and Cavalry.
Hospital Corps, 140, 412.
Uniform for, 343.
Hospitals, 370.
Extra duty pay, 370.
Military posts, 420.
Stewards' quarters, 374.
Identification system, 439.
Index-record card work, 51, 699.
Indians, 91, 189.
Enlistments, 218.
Issues to, by subsistence department, 397.
Reservations, 169.
Troops, 167.
Troubles, 170, 176, 190.
Prisoners of war, issues to, 340.
Infantry, 93.
Infantry and cavalry school, 100.
Regulations, 205.
Report of commandant, 204.
Infantry drill, 125.
Infantry, increase of, 18, 98, 221.
Infantry training, 239.
Influenza, 463.
Ingalls, Maj. J M., 208.
Injuries, wounds, etc., 497.
Insane, Government Hospital for, 19, 223.
Inspection duties, 22.
Inspection of posts, 193.
Inspection system, 182.
Inspections, 265, 275.
Inspector-General's Department, 22.
Inspector-General, report of, 20, 117, 227.
Irregularities, 146.
Irwin, Lieut. F. G., 176.
Jefferson Barracks, Mo., 365.
Jones, S. R., 175.
Judge-Advocate-General, reports of, 22, 281.
Kidd, J H., 42.
Kieffer Capt. R. F 437.
Kirkley J. W 715.
Ladd, Lieut. E. F., reports, 732-740.
Lawton, Lieut. Col. H. W., 117.
Lewis, Lieut. I. N report, 847
Library, Surgeon-General's Office, 29, 427.
post, 142.
War Department, 50, 676.
Lieber, Gen. G. M. report, 23, 287.
Limbs, artificial, etc., 28, 83, 411.
Litters, hand, 345.
Lusk, Capt. L. L., reports, 788, 813.

Lyceums, 100, 132, 167.
Magazine gun, 131.
Major-General commanding Army, report, 89.
Malarial infections, 479.
Mallory, Capt. J. S., report, 308.
Maneuvers, 21, 241.
Marches, 129.
Married men's quarters, 30, 31.
Marshall, Lieut. Col. J. M., 175.
Measles, 462.
Medical and hospital supplies, 414.
depots, 254.
officers, 427.
reports, special, 506.
Medico-military statistics, 454.
Merriam, Gen. H. C., report, 197.
Merritt, Gen. W., report, 166.
Mess, general, 153.
Michie, Prof. P. S., report, 805.
Miles, Gen. N. A., reports, 724, 837.
Military Academy, 17, 219.
Academic department, 795.
Accounts and supplies, 797.
Appropriations, 66.
Armament and equipment, 780.
Athletics, 784.
Band, 783, 797.
Battery, 785.
Battle monument, 797.
Board of Visitors, report, 773.
Buildings and grounds, 780, 798.
Cadet hospital, 783.
Discipline and instruction, 780, 797.
Estimates, 799.
Fiscal affairs, 784.
Graduating class, address to, 789.
Health, 796.
Hospital, 783.
Hotel, 781.
Hygiene, 783.
Instructor of military engineering, report, 810.
Instructor of ordnance and gunnery, report, 809.
Librarian's report, 804.
Library and building, 196, 781.
Memorial hall, 799.
Military carriage models, 736.
Museum, 786.
Officers' mess building, 782.
Ordnance, 797.
Personnel, 795.
Quartermaster's report, 818.
Quartermaster (of cadets) and commissary, report, 807.
Roster, 801.
Small arms, 786.
Superintendent's report, 13, 795.
Surgeon's report, 805.
Water supply, 787, 798.
Wharf, 782.
Military colleges, 16, 20, 26, 218.
signaling, 674.
establishment, appropriations, 65.
information division, 16, 215.
instruction, 173.
maps, 40.
medical administration, 443.
Military posts, appropriations, 26.
barracks and quarters, 24.
inspection, 119.
See Posts.
Militia, quartermaster issues to, 389.
quartermaster sales to, 340.
sales of stores to, 50.
Miller, Capt. C. P., 361.
Minor tactics, 126, 151, 179.
Miscellaneous appropriations, 82.
Mississippi River Commission, 39.
Levees, 41.
Missouri. *See* Department of.
Missouri River Commission, 39.
Monongahela Navigation Company, 43.
Monuments, etc., appropriations, 64.
Moore, Maj. F., 117, 125, 127, 132, 133, 136, 142, 143, 147.
Mounts for student officers, 245.
Mumps, 463.
Munson, Lieut. E. L., paper of, 507.
National cemeteries. *See* Cemeteries.
National Guard, 21.
Inspection, 238.
Medical department of, 436.
Signal Corps, 50.
Signaling, 673.
National Home for Disabled Volunteer Soldiers, 244.
Appropriations, 243, 247, 249.
Disbursements, 250.
Inspection, 249.
Prices of food at, 277.
National parks, 186.
Newspaper publications, 19, 222.
Nicholson, J. P., 55.
Noble, Alfred, 242.
Non commissioned officers, 240.
Pay, 19, 222.
Promotion, 94.
Officers, commissioned, 127.
Corps of Engineers, 34.
detached service of, 18.
Ordnance and fortification, report of board, 821.
Ordnance Department, estimates, 44, 48.
Ordnance sergeants, 141.
stores, 140.
Otis, Gen. E. S., reports, 168, 175, 198.
Outhwaite, J. H., reports, 836.
Overcoat, 342.
Pacific Railroads, 356.
Pan-American Medical Congress, 451.
Pasco, Samuel, 784.
Pay, appropriations, 31.
Pay clerk, 657.
Pay, deficiencies, 654.
disbursements, statement, etc., 658.
Pay department, financial statements, 651.
Pneumonia, 496.
Post cemeteries. *See* Cemeteries.
Public works, appropriations, 656.
Paymaster-General, report, 31, 651.
Payments of Army, 32, 33, 655.
Perry, L. J., 717.
Personal military records, publication of, 703.
Phipps, Maj. F. H., 837.

Photographs of the war, 50, 677.
Photography 209.
Physical training, 101.
Platte. *See* Department of.
Plattsburg Barracks, N. Y., 365.
Plunkett, W B., 784.
Posts, military, appropriations, 26, 67.
bakeries, 144.
barracks and quarters, 24.
commanders, 128.
exchanges, 99, 143, 184.
inspection, 119.
instructions, 323.
lyceum, 176.
Post-graduate schools, 100.
Practice marches, 187.
Presidio of San Francisco, Cal., 324, 367.
Prisoners' clothing, 343.
Professors of military science, report of average attendance of students, 226.
Property inspection of unserviceable, 147.
Providence Hospital, 421.
Public works, 242.
Quartermaster-General, reports, 23, 319.
Quartermaster's Department:
Contracts, 360.
Clothing and equipage, 320.
Duties, 320.
Expenditures for water, sewerage, etc., roads, bridges, etc. charged against army transportation, 371
Financial statements, 318, 327.
Inspection, 336.
Issues to Indian prisoners, 340.
Manufactures, 339.
Miscellaneous claims and accounts, 382.
Money accounts, 337
New constructions, 361.
Newspapers, etc., 383.
Printing and binding, 383.
Purchases at depots, etc., 38, 338, 360.
Regular supplies, 323, 359.
Remittances, 338.
Repairs, 361.
Returns, 337.
Sales to militia, etc., 340.
Tableware, 360.
Quarters, allowance, 21, 139.
rented, 375.
Rations, 30.
Raymond, Maj. C. W., 42.
Record and Pension Office, 51.
Clerical force, 708.
Furnishing information, 705.
Records, access to, 704.
Reports of chief of, 51, 691.
Recruiting, 437.
officers, 137.
service, 16, 216.
Recruits, 122, 137.
Reed, Maj. W., 430, 436, 509.
Regimental headquarters, 115.
Relief acts, appropriations, 85.
Remusters, etc., 692.
Reservations, military, 325.
criminal jurisdiction, 283.
Review and inspections, 120.
Revolutionary war records, 52, 53.
Rheumatic affections, 495.
Richardson, C. A., 55.
Rifle ranges, 18, 221.
Rifles, 44.
River and harbor estimates, 37, 41.
Roads, etc., 323.
Robbins, W. M., 55.
Rock Island Arsenal, 44.
Roentgen rays, 511.
Rogers, Col. J I., 842.
Ruggles, Gen. G. D., 99.
Salaries, contingencies, etc., appropriations, 64.
Sales by Subsistence Department, 398.
Sales to militia, 48.
San Diego Harbor defenses, 185.
Sanger, Maj. J.P., 117, 125, 126, 130, 132, 135, 138, 141, 142, 145.
Sanitary bathing, 578.
clothing, 577.
conditions, 29.
drainage and sewage, 548.
food, 567.
quarters, 545.
water, 553, 566.
Scarlet fever, 462.
Schools, 132.
post, 21, 100, 135, 177.
service, 21, 133.
Seacoast artillery fire, 840.
Board, report of, 842.
Fire command, 841.
Fire control and direction, 842.
Range and position finders, 841.
Installation of typical artillery fire command, 842, 843.
Instruments, 840.
Seacoast defenses, 34, 41.
Estimates, 37.
See Coast Artillery, fire.
Seacoast gun carriages, 46.
Secretary of War, colors and flags of, 322.
report of, 3.
Shafter, Gen. W. R., 185, 187.
Shiloh battlefield, 59, 60.
Commission's report, 59.
Ship canal (Puget Sound), 42.
Shoes, 321 342.
Shovels, etc., 346.
Sickness, etc. in army: statistical tables, 580, 687.
See also Diseases, special.
Signal Corps
Appropriations, 82.
Disbursements, 675.
Personnel, 675.
Signal equipments, 675.
Signalmen in army 680.
Signal returns and stores, 142, 676.
Signaling, field operations, 672.
in army, 670.
instruction, 49, 50.
Sixteen-inch gun, 45.
Small arms, 241.
target practice, 123, 133.
Smallpox, 463.
Smart, Lieut. Col. C., 407, 435.

Smedburg, W. R., 784.
Soldiers' Home (District of Columbia), 243.
Amusements, 743.
Commissioners' report, 11, 721.
Disbursements, 747.
Employees, 750.
Farm, 753.
Governor's report, 725.
Hospital, 754.
Improvements, 741.
Inspection, 741.
Laundry, 753.
Members, 743.
Officers, 742.
Receipts and expenditures, 733.
Secretary and treasurer's report, 732.
Statistical tables, 755–770.
Supplies, 751.
Surgeon's report, 727.
Water supply, 753.
Spokane (Washington) military post, 24, 324.
Springfield Armory, 44, 48.
Spurgin, Capt. W. F., 809.
Stanley, 726.
States, records of, 52.
Stanton, Gen. T. H., 23, 667.
Sternberg, 30.
Story, Capt. J. P., 208.
Stores, sale of, 241.
Storms, damage by, 374.
Strother, Lieut. L. H., 311.
Subsistence Department, Commissary General's report:
Estimates, 27.
Resources and expenditures, 391.
Roster, 400.
Subsistence depots, 253.
sales, 139.
stores, 140.
Suicides, 497.
Sullivan, Gen. T. C., 399.
Summary court act, 23, 285.
Surgeon-General's reports, 28, 411.
Surgical operations, effect of, 514.
Surgical reports, 510.
Surgical work outside military duties, 502.
Surveys, civil, appropriations, 83.
Suspenders, 343.
Tactical exercises, land for, 18.
Target practice, 355.
Small arms, 123.
Targets, 134.
Telegraph and telephone lines, post, 670.
Telegraph accounts, 668.
Telegraph cables, 50, 51, 674.
Telegraph lines, flying, 50, 669.
Telegraph lines, locations, etc., 679.
military, 49, 667.
Tennessee Centennial camp, 442.
Tents, 138, 321.
conical, 344.
for flood sufferers, 345.
for Grand Army reunion, 345.
shelter, 343.
Tests of metals, 45.
Texas. *See* Department of.
Transcripts of military records, 6, 701.
Transportation, 322, 354.
Accounts, 358.
Appropriations, 26.
Torney, Maj. G. H., 806.
Troops, disposition of, 102.
movement of, 355.
Department of California, 166.
Department of Colorado, 104.
Department of Columbia, 106.
Department of Dakota, 104.
Department of East, 102.
Department of Missouri, 102.
Department of Platte, 106.
Department of Texas, 106.
Tuberculosis, 496.
Typhoid fever, 468.
Serum diagnosis, 474.
Upson, W. H., report by, 784.
Venereal diseases, 494.
Vessels, Quartermaster's Department, 357
Vessels chartered, 357.
Veterinary surgeons, 142.
Volunteer officers, remuster of 50.
Vroom, Lieut. Col. P. D., 117, 123, 129, 141.
Wade, Gen. J. S., report of, 187.
Walker, W. F., report of, 784.
War claims of States, 83.
War Department documents:
Distribution of, 677.
Sale to National Guard, 678.
Washington City water supply, 39, 44.
public buildings and grounds, 40.
Washington, J. E., report of, 773.
War Records, 53.
Report of board, 53, 713.
War of 1812, records, 51, 53.
Water supplies, 30.
Water supply, etc., expenditures for, 371.
Watertown Arsenal, 45, 47, 48.
Watervliet Arsenal, 255.
Weeks, Gen. G. H., 26, 327.
Wheeler, Maj. D. D., 175.
Widows' fund, 21, 144.
Wilson, Gen. J. N., 40.
Wisner, G. Y., 42.